



**LAC-EA-16-06**

**ENVIRONMENTAL THRESHOLD DECISION  
PROGRAMMATIC ENVIRONMENTAL ASSESSMENT APPROVAL  
AND  
INITIAL ENVIRONMENTAL EXAMINATION (IEE)  
AMENDMENT to LAC-IEE-15-65**

<b>Activity Location:</b>	Honduras
<b>Activity Title:</b>	Programmatic Environmental Assessment for Development Objective 2
<b>Activity Number:</b>	TBD
<b>Life-of-Activity Funding:</b>	\$65,686,000
<b>Life-of-Activity:</b>	FY 2015 – FY 2019
<b>PEA Prepared By:</b>	The Cadmus Group, Inc. & Sun Mountain International
<b>Reference ETD &amp; Scoping Statement:</b>	LAC-IEE-15-65 and LAC-SS-16-01

**Action:**

The Bureau Environmental Officer approves the attached Programmatic Environmental Assessment (PEA) for the Resilience of Livelihoods Increased Project in Honduras. Reference Environmental Threshold Decision (ETD) LAC-IEE-15-65 resulted in a Categorical Exclusion, Negative Determination with Conditions, and a Positive Determination. The ETD addresses the completion of a PEA based upon the Positive Determination contained within LAC-IEE-15-65.

This approves the PEA's recommendation that the Alternative be implemented along with the Proposed Action. This approach will ensure that DO2 is achieved with the greatest positive effect on the significant issues identified.

This also amends the original IEE and Environmental Threshold Decision (ETD) (LAC-IEE-15-

65) to include the Programmatic Environmental Assessment (PEA) in the Development Objective 2 (DO2) Program. This IEE amendment clears the Positive Determination requirement of doing a PEA for the DO2 activities.

A **Negative Determination with Conditions** is recommended for implementing the activities regarding the attached DO2 PEA. For each site specific Activity, an EMMP is required to incorporate the existing PEA mitigation measures and to include any site specific new mitigation measures. The Implementing Partners are responsible to implement and monitor all of the mitigation measures that are listed in their site specific EMMP, that includes EMMP Mitigation Plan-Table 3 that has been completed and attached to the PEA. The site specific EMMP will determine if an EA is needed based upon the level of actions and impacts for the Activity. All other terms and conditions of the original IEE/ETD remain the same.

### **Background:**

This PEA was prepared for USAID/Honduras for on-going activities (i.e., underway or under contract) implemented in support of the USAID/Honduras Country Development Cooperation Strategy (CDCS) for 2015–2019. Development Objective 2 (DO2) of the strategy is as follows: “Extreme poverty sustainably reduced for vulnerable populations in western Honduras.” The PEA covers DO2 activities with foreseeable environmental impacts in the six western departments of Honduras (Santa Barbara, La Paz, Intibucá, Copán, Ocotepeque, and Lempira).<sup>1</sup> USAID prepared the PEA in response to recommendations from the Bureau Environmental Officer (BEO) and Regional Environmental Advisor (REA), as well as in response to the Honduras Mission’s concerns about cumulative impacts. *While several elements of the Proposed Action—specifically those related to water management infrastructure and roads—may require stand-alone Environmental Assessments (EAs) or Environmental Mitigation and Monitoring Plans (EMMPs), other elements may not require additional analysis.* The PEA’s scope is as follows:

- Assess the environmental effects of a number of individual actions and their cumulative environmental impact in western Honduras (consistent with 22 CFR 216.6(d)).
- Describe alternative activities which would avoid or minimize adverse effects or enhance the quality of the environment (consistent with 22 CFR 216.6(a)), within the scope of project’s purpose statement (Section 1.2) and in accordance with the objectives of DO2.
- Support USAID/Honduras in the preparation of mitigating measures to reduce the negative impact of planned activities.

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<sup>1</sup> This PEA, and the Scoping Statement that preceded it, complies with USAID environmental procedures as specified by 22 CFR 216.3(a)(5) and 22 CFR 216.3(a)(4), respectively. This PEA follows the format required by USAID in 22 CFR 216.6 and is consistent with U.S. government best practice.

**Conditions of this approval for the PEA include:**

1. USAID/Honduras shall fully implement all the new actions listed for the Alternative, in addition to implementation of all actions in the Proposed Action, to ensure that DO2's objectives are achieved with the greatest positive effect on the significant issues identified in the PEA.
2. The Environmental Mitigation and Monitoring Plan (EMMP) for the PEA shall be implemented and the Conditions for EMMPs of LAC-IEE-15-65 shall be followed.
3. The project's implementing partner budget must incorporate the cost of implementing, monitoring, and evaluating Environmental Mitigation and Monitoring Plans (EMMP) to-be-developed for activities described in the PEA.
4. Partner must use the USAID/Honduras DO2 PEA EMMP to develop Activity and site-specific EMMPs. Each project-specific EMPP must be submitted to USAID for approval. As appropriate, EMMPs shall incorporate mitigation measures contained in PEA and its annexes.
5. Compliance with the USAID/Honduras Pesticide Use Report and Safe Use Action Plan (PERSUAP) and its attendant Integrated Pest Management Plan. The PERSUAP is not part of the attached PEA, but is a linked analysis.
6. The Mission and/or an external firm shall conduct an evaluation of the PEA's selected actions and EMMP mitigation measures to determine if they were implemented and their effectiveness. Results from the mid-term evaluation shall be used to modify actions in future work plans as necessary.
7. Implementing partner is responsible for implementing all relevant mitigation measures stipulated in the PEA and to be contained in forthcoming EMMPs. Partner must report on the efficacy of EMMPs and any relevant environmental concerns on a quarterly and annual basis, in line with agreement requirements for performance reporting. EMMP monitoring and evaluation tables, or an approved equivalent, should be included in all quarterly and annual performance reports.
8. The AORs/CORs together with the Mission Environmental Officer for USAID/Honduras, with support from the Regional Environmental Advisor for Central America/Mexico will review the status of the implementation of the mitigation and monitoring plan and conduct field monitoring of the EMMP mitigation measures at least once per quarter of each fiscal year, to ensure that it is in compliance with applicable USAID policies and regulations.
9. Each Activity Manager or Contracting or Agreement Officer Representative (COR or AOR) is responsible for making sure environmental conditions are met (ADS 204.3.4). In addition, CORs/AORs and Implementing Partner Chief of Party(ies) are responsible for ensuring that appropriate environmental guidelines are followed, mitigation measures

in the PEA are funded and implemented and that adequate monitoring and evaluation protocols are in place to ensure implementation of mitigation measures.

10. It is the responsibility of the Development Objective (DO) Team to ensure that environmental compliance language from the ETD is added to procurement and obligating documents, such as activity-related Development Objective Grant Agreements (DOAGs) and Activity Approval Documents (AADs).
11. All terms and conditions specified in LAC-IEE-15-65 remain in effect.

\_\_\_\_\_signed\_\_\_\_\_ Date \_07/25/16\_\_\_\_\_  
Diana Shannon  
Bureau Environmental Officer  
Bureau for Latin America & the Caribbean

Attachment: USAID/Honduras Programmatic Environmental Assessment for Development Objective 2 (PEA); (the Clearance Page is included before the PEA)

File Locations:

- LAC Bureau - P:\LAC.RSD.PUB\ENV\Reg 216\IEE\IEE16
- Environmental Compliance Database – this document will be posted to the environmental compliance database at <http://gemini.info.usaid.gov/egat/envcomp/index.php>

in the PEA are funded and implemented and that adequate monitoring and evaluation protocols are in place to ensure implementation of mitigation measures.

10. It is the responsibility of the Development Objective (DO) Team to ensure that environmental compliance language from the ETD is added to procurement and obligating documents, such as activity-related Development Objective Grant Agreements (DOAGs) and Activity Approval Documents (AADs).
11. All terms and conditions specified in LAC-IEE-15-65 remain in effect.



Date Jul, 25, 2016

Diana Shannon  
Bureau Environmental Officer  
Bureau for Latin America & the Caribbean

Attachment: USAID/Honduras Programmatic Environmental Assessment for Development Objective 2 (PEA); (the Clearance Page is included before the PEA)

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**Signature Page: IEE Amendment No. 1 of LAC-IEE-15-65****Concurrence:**Date: 22 JUNE 2016

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# USAID/HONDURAS PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR DEVELOPMENT OBJECTIVE 2



**FRONT COVER:** Mixed crops on steep slopes in the department of Lempira demonstrating the incremental nature of implementing soil conservation measures.  
Photo Credit: Charles Hernick, The Cadmus Group, Inc.

# USAID/HONDURAS PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA) FOR DEVELOPMENT OBJECTIVE 2

MAY 2016

Prepared for:

USAID/Honduras

Bureau for Latin America and the Caribbean

United States Agency for International Development

**Prepared under:**

The Global Environmental Management Support Project (GEMS), Award Number AID-OAA-M-11-00021. The Cadmus Group, Inc., prime contractor ([www.cadmusgroup.com](http://www.cadmusgroup.com)). Sun Mountain International, principal partner ([www.smti.org](http://www.smti.org)).



**DISCLAIMER**

Until and unless this document is approved by USAID as a 22 CFR 216 Programmatic Environmental Assessment, the contents may not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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## LIST OF ACRONYMS

AYS	Average Years of Schooling
BEO	Bureau Environmental Officer
COPECO	Comisión Permanente de Contingencias
CDCS	Country Development Cooperation Strategy
DAP	Departamento de Áreas Protegidas
DIBIO	Dirección General de Biodiversidad
DIGEPESCA	Dirección General de Pesca
DO	Development Objective
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMMP	Environmental Mitigation and Monitoring Plan
EMPR	Environmental Management Programme Reports
ENSO	El Niño Southern Oscillation
ESIA	Environmental and Social Impacts Assessment
FAO	Food and Agriculture Organization for the United Nations
GAP	Good Agricultural Practice
GEMS	Global Environmental Management Support
GMO	Genetically Modified Organism
GMP	Good Manufacturing Practice
GoH	Gobierno de Honduras (Government of Honduras)
HDI	Human Development Index
IEE	Initial Environmental Examination
ICF	Instituto de Nacional de Conservación Forestal y Vida Silvestre
ICM	Integrated Crop Management
IHAH	Instituto de Antropología e Historia
IHT	Instituto de Turismo
INSEP	Secretary of Infrastructure and Public Services
IP	Implementing Partner
IR	Intermediate Results
JAA	Juntas Administradora de Agua
MAPANCE	La Mancomunidad de Municipios del Parque Nacional Montaña de Celaque
MOCAPH	Mesa de ONGs Comanejadoras de Areas Protegidas de Honduras
MSME	Micro, Small, and Medium Sized Enterprises
PAG	Proyecto Aldea Global
PEA	Programmatic Environmental Assessment
PERSUAP	Pesticide Evaluation Report and Safer Use Action Plan
PLCI	Permanent Land Cover Index
PNMC	Parque Nacional Montaña Celaque
REA	Regional Environmental Advisor
REHNAP	Red Hondureña de Reservas Naturales Privadas
RUP	Restricted Use Pesticides
SENASA	Servicio Nacional de Sanidad Agropecuaria
SEPLAN	Secretaría de Planificación

SERNA	The Ministry of Energy Natural Resources Environment and Mines (now known as MiAmbiente)
USAID	United States Agency for International Development
USGS	United States Geological Survey
WAB	Water Association Boards
WRI	World Resources Institute
ZOI	Zone of Influence

## EXECUTIVE SUMMARY

This Programmatic Environmental Assessment (PEA) was prepared for USAID/Honduras for on-going activities (i.e., underway or under contract) implemented in support of the USAID/Honduras Country Development Cooperation Strategy (CDCS) for 2015–2019. Development Objective (DO) 2 of the strategy is as follows: “Extreme poverty sustainably reduced for vulnerable populations in western Honduras.” The PEA covers DO2 activities with foreseeable environmental impacts in the six western departments of Honduras (Santa Barbara, La Paz, Intibucá, Copán, Ocotepeque, and Lempira).<sup>2</sup>

The Proposed Action is multifaceted and complex. It includes activities:

- at different stages of planning and implementation
- with differing implementation strategies
- with different historical precedent (e.g., agricultural projects have long-standing USAID precedent, while energy and roads projects are a new part of the portfolio)
- with different levels of environmental compliance requirements, for example several elements of the Proposed Action do not require additional environmental analysis, some have Environmental Mitigation and Monitoring Plans (EMMPs), and some may ultimately require stand-alone Environmental Assessments (EAs)

USAID prepared this PEA in response to recommendations from the Bureau Environmental Officer (BEO) and Regional Environmental Advisor (REA) as well as in response to the Honduras Mission’s concerns for cumulative environmental and social impacts of programming. Therefore, this PEA is intended to:

- assess the environmental effects of a number of individual actions and the actions’ cumulative environmental impacts across the six western departments of Honduras (consistent with 22 CFR 216.6(d))
- propose alternative activities that would avoid or minimize adverse effects or enhance the quality of the environment (consistent with 22 CFR 216.6(a)), within the scope of the project’s purpose statement (Section 3) and in accordance with the objectives of DO2
- support USAID/Honduras in the preparation of new mitigating measures to reduce the negative impact of planned activities
- improve the overall environmental performance of DO2 activities

This PEA does not substitute for project-specific environmental screening and analysis required under 22 CFR 216. However, the information and analysis in this PEA may be used to inform those analyses.

**The PEA recommends that the Alternative be implemented along with the Proposed Action.**<sup>3</sup> This approach will ensure that DO2 is achieved with the greatest positive effect on the significant issues identified.

## SUMMARY OF THE SECTIONS OF THE PEA

Section 1 describes the regulatory context and methodology for the PEA, including the scoping process. Section 2 presents the environmental and social baseline conditions (i.e., existing conditions) in the area of

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<sup>2</sup> This PEA, and the Scoping Statement that preceded it, complies with USAID environmental procedures as specified by 22 CFR 216.3(a)(5) and 22 CFR 216.3(a)(4), respectively. This PEA follows the format required by USAID in 22 CFR 216.6 and is consistent with U.S. government best practice.

<sup>3</sup> The Proposed Action is defined in Section 4 to include existing mitigation measures in approved EMMPs.

the affected environment, as required by 22 CFR 216.6(c)(4). In the context of this baseline, Section 3 describes the purpose and need to which the Agency is responding through DO2.

The Proposed Action is described in Section 4. The activities are already underway or under contract with Implementing Partners and therefore have mitigation measures consistent with USAID environmental compliance requirements.<sup>4</sup> The broad range of actions planned under DO2 are classified into the following major components for purposes of analysis in this PEA:

- A. Improve Management of Natural Resources and Biologically Significant Areas
- B. Increase Adaptive Capacity and Resilience of Target Communities and Poor Households to Climate Change
- C. Increase Incomes and Reduce Poverty through Targeted Interventions in the Agriculture Sector
- D. Increase Incomes, Reduce Poverty, and Increase Household-Level Resilience through Targeted Interventions in Non-Ag Livelihoods
- E. Improve Service Delivery and Management Systems for Local Public Services
- F. Improve Access to Essential Infrastructure
- G. Integrate Implementation<sup>5</sup>

Section 5 describes **13 issues** identified as *potentially significant* by the Assessment Team during scoping, consistent with 22 CFR 216.3(a)(4)(a), and evaluated in this PEA. This evaluation is based on considerations of the issues' *likely or reasonably foreseeable* scope, direct effects, indirect effects, and cumulative effects on the environment *as a result* of the Proposed Action.

Section 6 defines the No Action Alternative and the Alternative to address the issues identified in scoping and to fulfill the purpose and need (consistent with 22 CFR 216.6(c)(3)). Compared to the Proposed Action alone, **the Alternative would provide an additional complimentary route to development in western Honduras that emphasizes a protected area- and watershed-focused approach to development.** The additional elements of the Alternative enhance the Proposed Actions from a technical aspect and would implement watershed planning and pilot actions, while implementing the Proposed Action ongoing activities in the same existing areas.

ALTERNATIVE	DISTINGUISHING TECHNICAL ASSISTANCE CHARACTERISTICS	DISTINGUISHING GEOGRAPHIC APPROACH
No Action	Continuation of the status quo environmental and development scenario in western Honduras absent any and all USAID intervention (e.g., limited soil conservation and irrigation on farms, limited pesticide management, limited source water protection, no extension/technical assistance from USAID Activities)	N/A
Proposed Action	Direct on-farm capacity building and technology introduction, protection and development of water resources for irrigation, development of agricultural value chains, rural electrification, and road planning	Interventions targeted in geographic areas historically supported by USAID plus new immediately adjacent sites

<sup>4</sup> Due to the evolving nature of the activities and contracts the Environmental Mitigation and Monitoring Plans were not available to the Assessment Team at the onset of the PEA. Some information was made available for analysis later on.

<sup>5</sup> The last component (G) includes one activity that describes the integrated approach USAID and implementing partners (IPs) utilize to holistically contribute to poverty reduction.

ALTERNATIVE	DISTINGUISHING TECHNICAL ASSISTANCE CHARACTERISTICS	DISTINGUISHING GEOGRAPHIC APPROACH
Alternative	<p>Direct on-farm capacity building and technology introduction, protection and development of water resources for irrigation, development of agricultural value chains, rural electrification, and road planning</p> <p>For new/additional activities, work through a local third party (e.g., buyers or a non-governmental organization) to provide technical assistance</p> <p>Manage social effects and water resources through strengthened Consejos de Cuencas</p> <p>Increased Planning and data gathering in watershed management, climate change, and protected areas carrying capacity for tourism</p> <p>Piloting of water storage for potable water and irrigation</p>	<p>Interventions targeted in geographic areas historically supported by USAID plus new immediately adjacent sites</p> <p>For new/additional activities, interventions falling within (i.e., organized by) targeted watersheds and micro watersheds—one in each Department</p>

Section 7 of the PEA describes the reasonable anticipated environmental effects of No Action, the Proposed Action, and the Alternative. The environmental consequences analysis required by 22 CFR 216.6(c)(3) is conducted using metrics for comparison.<sup>6</sup>

As shown in the summary table below, the No Action alternative has the greatest adverse environmental effects overall. Because the activities that make up the Proposed Action are already underway and because the Alternative would require a data-driven and planning-intensive approach that would take several years to fully implement, the analysis and implementation of new Alternative actions based on the data and planning would be implemented within a 1 to 3 year timeframe while the Proposed Actions are continuing.

ALTERNATIVE	SHORT-TERM EFFECTS	LONG-TERM EFFECTS	CUMULATIVE EFFECT
No Action	Greatest adverse effect	Greatest adverse effect	Greatest adverse effect
Proposed Action	Short-term positive effect on the significant issues because the activities are underway and mitigation measures are sufficient	Without additional measures some adverse effects or not fully mitigated or avoided	Low negative social and environmental impact in the short-term because the activities are underway and mitigation measures are sufficient, but over time benefits of the Alternative exceed the benefits of the Proposed Action
Alternative <b>RECOMMENDED</b>	Short-term positive effect on the significant issues because the activities are underway and mitigation measures are sufficient	Greatest long-term positive effect on the significant issues because additional activities are designed for environment	Lowest adverse social and environmental impact overall as it includes all of the Proposed Actions and additional actions that address cumulative impacts through additional extension and integrated planning actions

<sup>6</sup> For the purposes of environmental effects analysis, a metric for comparison was established in Section 6 for each issue. In the majority of cases a qualitative metric was used due to the overwhelming lack of detailed baseline environmental information and monitoring.

Section 8 documents the PEA findings. While the environmental benefits of the Alternative are substantive and would yield long-term sustainable results, the Assessment Team found that without the simultaneous implementation of the Proposed Action (i.e., existing projects already under contract) some avoidable adverse environmental impacts would result due to the stoppage of the Proposed Action. Thus the Alternative has included all of the Proposed Actions that would continue while the planning/data gathering actions of the Alternative are being done. Because the Alternative and the Proposed Action are not mutually exclusive they would be conducted concurrently to achieve the greatest environmental benefit (as shown in the figure below).

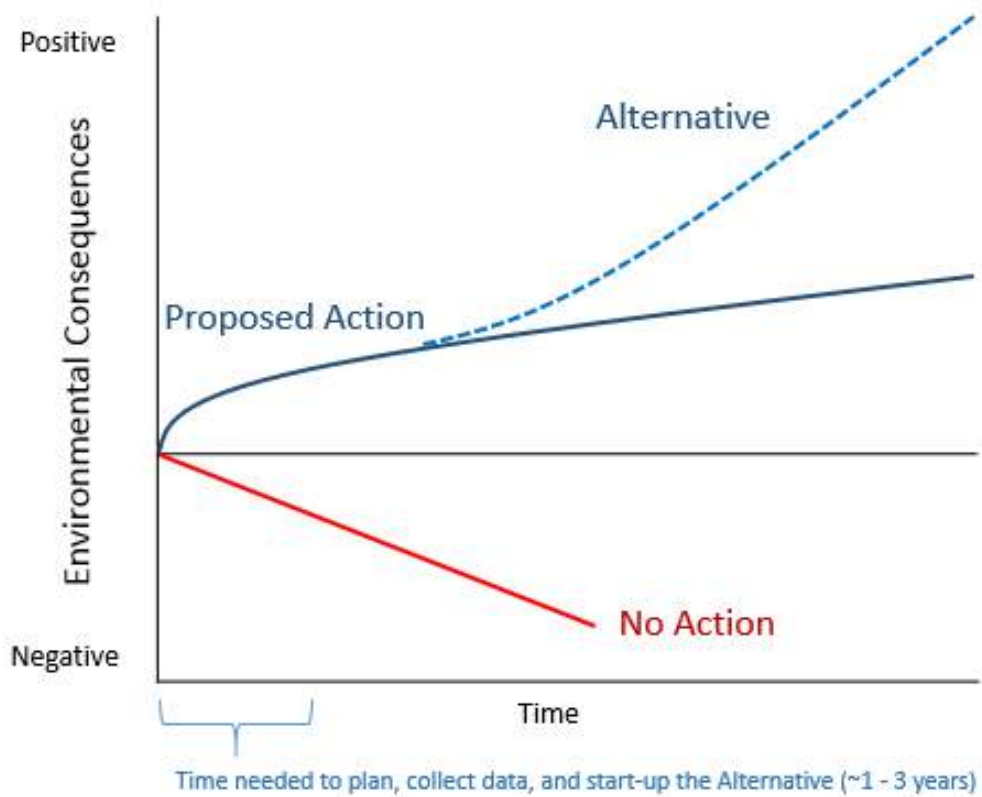
The Alternative enhances the ongoing Proposed Actions. USAID could fund the Alternative or elements of the alternative through a separate contract (or modify existing contracts) to build on the Proposed Action, laying the framework for sustainable long-term watershed-based development. The Alternative proposes the comprehensive delineation and protection of the source waters for water irrigation and potable water projects to assure quality and quantity (i.e., an approach to fully planning for development in the watersheds, including USAID projects and identifying water allocations for all current users). As shown in the figure below, implementing the Alternative—or components of it—in addition to the Proposed Action would help assure the long term sustainability and resiliency of producers and markets and climate changes, extend the useful life of infrastructure, and the safeguard of natural resources and ecosystem services in the western area of Honduras.

Therefore, **the PEA recommends that the Alternative also include the implementation of all of the actions listed in the Proposed Action** in addition to the new actions listed for the Alternative. As shown in the summary table below and in the following figure, this approach will ensure that DO2 is achieved with the greatest positive effect on the significant issues identified.<sup>7, 8</sup>

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<sup>7</sup> The Proposed Action is defined in Section 4 to include existing mitigation measures in approved EMMPs.

<sup>8</sup> One of the elements of the alternative is installation of a pilot water storage system (for irrigation and domestic use). This system would allow USAID and stakeholders in each department to fully understand the environmental and social benefits and risks of these types of systems over time. If more than one water storage system is developed in each department, the Assessment Team recommends that a stand-alone supplemental Environmental Assessment be conducted to further define mitigation measures.



## SUMMARY OF THE RECOMMENDED ACTION

NOTE: There are a number of elements of the Proposed Action that had no issues associated with them. These elements of the proposed action are enumerated in 6.2 ALTERNATIVES COMPARISON and are recommended to proceed unchanged as a part of the Proposed Action. Therefore, they are excluded from the following table because corresponding alternatives were not necessary and therefore not developed.

NO.	ISSUE AREA (abbreviated)	PROPOSED ACTION (abbreviated, see Section 4 for full description)	THE ALTERNATIVE <sup>9</sup> (abbreviated, see Section 6 for full description)
PESTICIDES			
1	Use of restricted use pesticides (RUPs)	Pesticide promotion—farmer education and promotion on PERSUAP-approved pesticides to reduce demand for RUPs (i.e., reduce RUP demand)	Proposed Action + Work with agriculture stores to reduce the supply of RUPs and assure the availability of PERSUAP-approved agrochemicals (i.e., reduce RUP supply) Collaborate with GoH agencies involved in pesticides to reduce the number of RUPs and illegitimate products on the acceptable list of GoH pesticides
2	Failure to use PPE	Working directly with farmers to educate on recommended pesticides, promote proper use of pesticides and PPE (i.e., increase PPE demand)	Proposed Action + Work with agriculture stores to develop promotions for PPE with the purchase of pesticides thereby increasing PPE supply (e.g., discount on PPE—specifically single use ponchos—or free PPE with the purchase of select pesticides)
AGRICULTURE			
3	Return to traditional methods and/or shift away from GAPs	Technical assistance on good agricultural practices and introduction of agricultural technology both promoted <i>directly by USAID IP</i>	Proposed Action + Technical assistance on good agricultural practices and introduction of agricultural technology both promoted <i>directly by the cooperative, NGO, or buyer working with the USAID IP</i>
4	Loss of forests and biodiversity from agricultural expansion	Reclaiming fallow lands (no deforestation) to expand production area, with areas selected by IPs based on previous work	Proposed Action + Select and promote projects consistent with the Plan de Manejo in the buffer zones and immediately outside nearby protected areas (includes reclaiming fallow lands; no deforestation)
5	Overreliance on chemical fertilizers	Installation of biodigesters, use of natural gas for energy, and compost byproducts	Proposed Action + Technical assistance to increase composting and composting efficiency

<sup>9</sup> This column summarizes elements of the Alternative corresponding to each issue. The PEA recommends that the Alternative—or elements of it—be carried out with the Proposed Action through additional contracts or contract modifications to achieve the greatest long term environmental and social benefit.

NO.	ISSUE AREA (abbreviated)	PROPOSED ACTION (abbreviated, see Section 4 for full description)	THE ALTERNATIVE <sup>9</sup> (abbreviated, see Section 6 for full description)
	when on-farm bio-matter is used for energy		
6	Risk of market rejection if products and processed foods do not comply with sanitary standards	Strengthen market linkages. Improve access to high-value markets through certifications	Proposed Action + Work with CENASA and Health Ministry on training for food safety measures, to establish market certification and sanitary regulations, and improve product quality
7	Insufficient climate change adaptation measures and failure to design for future conditions	Water management technology for irrigation, road planning, installation of potable water systems, development of water harvesting reservoirs, diversify crops, technical assistance on good ag practices, and introduction of agricultural technology implemented without (a) climate information or (b) risk screening to guide technology selection and integrate programs	Proposed Action + (a) Establish an information system for western Honduras that compiles data from all the meteorological and hydrological stations as well as water quality and quantity monitoring stations. The system should be maintained by a local university or research center to ensure that it will be available regardless of USAID activity. Information will be shared broadly among IPs, farmers, and governments to ensure that information is used in decision-making (b) Same as Proposed Action, except: Implemented with climate information and risk screening based on local climate information to guide technology selection and integrate programs Proposed Actions would continue while the climate data is being gathered
WATER			
8	Risk of source water protection failure	Source water protection Watershed master plans Water management technology for irrigation Water harvesting reservoirs Potable water systems	Proposed Action (in existing locations) + Assurance of water quality and quantity at the source for irrigation and potable water projects within (newly selected) targeted sub-watershed in each department. At least three sub-basins within each targeted sub-watershed will be fully declared and demarcated following ICF procedures, with trained water boards and water district staff
9	Diminished downstream water availability and water quality from over-extraction	Development of water resources for irrigation and potable water systems and household improvements and development of waste management and landfills with mitigation measures	Proposed Action + (1) Measure water extraction and use—providing the information to Consejos de Cuencas (to be established, see issue 11), and (2) Design and implement pilot water storage system for multiple purposes (agriculture and potable water) and ensuring equitable access for downstream users. The pilots should be designed for retention and storage for human use and, to the extent possible, for groundwater recharge and flood control. The

NO.	ISSUE AREA (abbreviated)	PROPOSED ACTION (abbreviated, see Section 4 for full description)	THE ALTERNATIVE <sup>9</sup> (abbreviated, see Section 6 for full description)
			<p>systems should be designed to utilize gravity for water transport, and then utilize solar energy if pumping or disinfection is required. The scale and the selection of the projects should be in accordance with technical data derived from an impact assessment process. Promoting water storage either for infiltration or for consumption will have a direct effect on resilience for drought and also for reduction of downstream flooding. The infrastructure investment should be complemented by capacity building for users and local governments on water management so that the systems comply with applicable laws and support equitable water use. Include sanitary practices in water systems, such as latrines or sewage systems and waste treatment plants, as well as health education.</p> <p>Designate landfill areas and design to avoid water source pollution.</p> <p>the purposes of this PEA, pilot systems are defined as water storage systems that would provide a learning opportunity for USAID and stakeholders in each department, allowing the full environmental and social benefits and risks to be understood over time. If more than one water storage system is developed in each department, the Assessment Team recommends that a stand-alone supplemental Environmental Assessment be conducted to further define mitigation measures</p>
10	Risk of water systems failure due to lack of financial resources, financial capacity, and technical capacity for maintenance and replacement	Technical assistance for water boards, development of water management technology for irrigation, development of potable water systems	Proposed Action + Financial plans specifying water system revenue requirements and rate adjustment plans to cover specified needs. When installing irrigation systems, farmers and/or cooperatives need to set aside funds to cover the depreciation costs of (1) the distribution system, (2) filters, (3) intakes and maintenance. Rates should also cover operating and maintenance costs. This will require training and enforcement to ensure that costs are calculated appropriately and the rationale for these costs is understood
11	Weak coordination between USAID projects, and between implementing partners and the government of	Source water protection Watershed master plans Production area expansion Water management technology for irrigation Water harvesting Potable water systems Roads	Proposed Action + Establishment of and participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos de Cuencas to discuss and resolve issues associated with economic development, the development of water resources, and forest use. The composition of the Consejos is specified by the Water Law and includes municipal governments, farmers' groups, and other stakeholders making land development and water development decisions, and therefore, can

NO.	ISSUE AREA (abbreviated)	PROPOSED ACTION (abbreviated, see Section 4 for full description)	THE ALTERNATIVE <sup>9</sup> (abbreviated, see Section 6 for full description)
	Honduras	Integration	help ensure that USAID projects are consistent with other local development plans and actions, and do not exacerbate existing social disparities and problems
12	Increased social disparity as a result of limited participation in USAID projects within communities: the socio-economic disparity between project beneficiaries and non-beneficiaries, if present conditions prevail, could cause community conflicts, exacerbating risk of migration and land clearing (rent seeking)	Water management technology for irrigation Strengthen market linkages Improve access to high-value markets through certifications	(same as 11 above)
PROTECTED AREAS			
13	Unsustainable tourism or community use of protected areas. Increased tourism could result in exceeding the carrying capacity for visitors	Value chains that facilitate biodiversity conservation Ecotourism promotion	Proposed Action + Conduct a carrying capacity study for each protected area in the Corredor Seco (Western Dry Corridor) to determine the maximum daily number of tourists to be permitted access to ensure the sustainable use of the natural resources. Prepare a public use plan for each protected area to ensure land use is compatible with protected area status. The outcome of the carrying capacity study would then define additional actions or direction for tourism within protected areas. To promote awareness, mark boundaries of protected areas with concrete or other suitable markers

# I. INTRODUCTION

This PEA (Programmatic Environmental Assessment) was prepared for USAID/Honduras for activities to be implemented in support of Development Objective 2 (DO2): “Extreme Poverty Sustainably Reduced for Vulnerable Populations in western Honduras.” The PEA covers DO2 activities with foreseeable environmental impacts in the six western departments of Honduras (Santa Barbara, La Paz, Intibucá, Copán, Ocotepeque, and Lempira).

**USAID prepared this PEA in response to recommendations from the Bureau Environmental Officer (BEO) and Regional Environmental Advisor (REA), as well as in response to the Honduras Mission’s concerns about cumulative impacts.** While several elements of the Proposed Action—specifically those related to water management infrastructure and roads—may require stand-alone Environmental Assessments (EAs) or Environmental Mitigation and Monitoring Plans (EMMPs), other elements may not require additional analysis. Therefore, the PEA is intended to:

- Assess the environmental effects of a number of individual actions and their cumulative environmental impact in western Honduras (consistent with 22 CFR 216.6(d)).
- Describe alternative activities which would avoid or minimize adverse effects or enhance the quality of the environment (consistent with 22 CFR 216.6(a)), within the scope of project’s purpose statement (Section 1.2) and in accordance with the objectives of DO2.
- Support USAID/Honduras in the preparation of mitigating measures to reduce the negative impact of planned activities.

This PEA, and the Scoping Statement that preceded it, complies with USAID environmental procedures as specified by 22 CFR 216.3(a)(5) and 22 CFR 216.3(a)(4), respectively. This PEA follows the format required by USAID in 22 CFR 216.6. It identifies the potentially significant impacts that could result from the Proposed Action as well as a study of alternatives and effects.

## I.1 BACKGROUND

### I.1.1 USAID/HONDURAS

In the USAID/Honduras Country Development Cooperation Strategy (CDCS) for 2015–2019, USAID/Honduras identified two DOs to meet the stated goal of a “more prosperous and safer Honduras that advances inclusive social and economic development among vulnerable populations.”

The two DOs are:

- DO1: Citizen Security Increased For Vulnerable Populations In Urban, High-Crime Areas
- DO2: Extreme Poverty Sustainably Reduced For Vulnerable Populations In Western Honduras

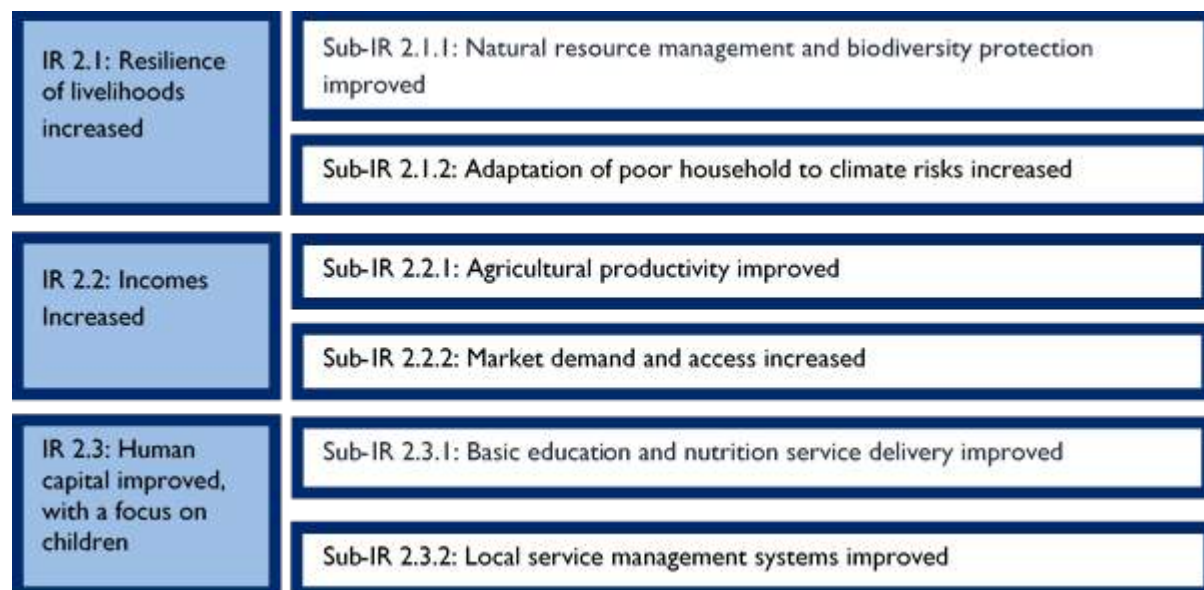
USAID/Honduras implements programs to strengthen the participation of marginalized groups in local and national governance, increase food security for the poorest sectors of society, support renewable energy and environmental conservation, and improve decentralized health care in terms of quality and access for local citizens and civil society. USAID projects work to spur economic growth, advance social justice, improve education and health, and engage the poorest members of Honduran society in the country’s development. USAID/Honduras efforts, through DO1, also address citizen security through community-based crime prevention activities and seek to expand basic education and skills training for at-risk youth and adults.

DO2 was developed based on the hypothesis that if natural resources and biodiversity are protected and enhanced, resilience of livelihoods to climatic and economic shocks is strengthened (IR 2.1), families are able

to increase their incomes (IR 2.2), and human capital is improved through improved education and health for these communities (IR 2.3), resulting in a sustainable reduction of poverty in western Honduras.

Thus, DO2 activities are designed to help poor families acquire tools to sustainably increase household incomes through improved resource management and human capacity. DO2 activities operate through Interim Results (IRs) (see Figure 1).

**FIGURE 1. IRS FOR DO2**



USAID/Honduras' current food security interventions integrating nutrition, sanitation, and income-generation investments have lifted thousands of families out of extreme poverty and decreased the percentage of underweight children under two years of age. Partnerships with, and capacity building of national and local governments, civil society, and decentralized service providers have contributed to significant gains in national health and education outcomes, including a 30 percent increase in grade six reading proficiency between 2010 and 2012 and a reduction in chronic malnutrition in children (SS, INE, and ICF International, 2013).

Through DO2, USAID/Honduras will build on USAID experiences to date and maximize outcomes through greater technical and geographic focus and integration, pairing immediate poverty reduction activities such as farm level improvements with longer-run service improvement initiatives in education, health, biodiversity, water, energy, and climate change adaptation. Through implementation of this DO, USAID will help Honduras reduce poverty through increased incomes and resilience. Investments will also lead to better quality primary education; improved health with focus on water, sanitation, and nutrition; environmental sustainability; and global partnerships for development.

### **I.1.2 USAID'S ENVIRONMENTAL PROCEDURES**

USAID's environmental procedures, as specified in 22 CFR 216 (also known as Reg. 216), govern the environmental review process for all projects, programs, or activities supported by USAID. As specified in 22 CFR 216.2(d), the following are the Classes of Actions Normally Having a Significant Effect on the Environment and which require an EA:

- programs of river basin development
- irrigation or water management projects, including dams and impoundments
- agricultural land leveling

- drainage projects
- large-scale agricultural mechanization
- new lands development
- resettlement projects
- penetration road building or road improvement projects
- power plants
- industrial plants
- potable water and sewerage projects other than those that are small-scale

At the time of this PEA's preparation, the three DO2 Initial Environmental Examinations (IEEs) were drafted, but only one covering I.R 2.1 had been approved.<sup>10</sup> While several elements of the Proposed Action—specifically those related to water management infrastructure and roads—may require an EA, other elements may not. However, all together the cumulative effects of the small-scale activities may be significant.

According to 22 CFR 216.6(d), a PEA “may be appropriate in order to assess the environmental effects of a number of individual actions and their cumulative environmental impact in a given country or geographic area, or the environmental impacts that are generic or common to a class of agency actions, or other activities which are not country-specific.” To the extent possible, the form and content of the PEA should be the same as for an EA.

### **I.1.3 STATUS OF THE PROPOSED ACTIVITIES IN RELATION TO HONDURAS' IMPACT ASSESSMENT REQUIREMENTS**

This PEA was developed for USAID/Honduras as a programmatic assessment undertaken on a voluntary basis to comply with 22 CFR 216. Therefore, the assessment will not be submitted to the government of Honduras.

However, some elements of the hydroelectric projects in the Proposed Action are classified by Mi Ambiente as projects requiring environmental review as Category 1 or 2 projects (out of four categories; Category 4 being defined as mega-projects). Under Honduran law, scoping processes, public participation, and/or environmental impacts assessment (EIA) are required for Category 2, 3, and 4 projects. Category 1 projects, while exempt from EIA requirements, still must comply with all environmental laws and policies as well as any monitoring requirements. The regulatory framework of Honduras' National EIA system indicates that the public must be informed at the inception of all EIA processes.

### **I.1.4 METHODOLOGY OF THE ENVIRONMENTAL ASSESSMENT PROCESS**

The scoping phase of this PEA occurred in September to November 2015. In accordance with Reg. 216, scoping, the first phase of the PEA process, begins with the identification of potentially significant issues related to the Proposed Action and the determination of the scope of the issues to be addressed in the Assessment. To determine the scope of the PEA, Reg. 216 encourages a participatory approach. As stated in 22 CFR 216.3(a)(4), persons having expertise relevant to the environmental aspects of the Proposed Action shall participate in the scoping process.

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<sup>10</sup> LAC-IEE-15-65 had been approved. IEEs contain the first-order environmental examination for defined activities. That only one of the IEEs had been approved was an indicator that not all of the projects had been fully/finally defined and the first-order environmental analysis had not yet been conducted. Therefore, this PEA specified many of the activities for the first time for the purposes of environmental examination. However, this PEA does not substitute for stand-alone IEE analysis required by regulation.

The Assessment Team consisted of five people with expertise in the following disciplines: EIA, ecology, hydrology/integrated water resources management, agroforestry, and sociology (see Annex K for bio-sketches of Team members). To achieve the scoping objectives, the Assessment Team completed the following tasks established by the Work Plan, many of which were executed concurrently.

1. **Identification/description of Purpose and Need and Proposed Action**<sup>11</sup> based on information provided by USAID and implementing partners (IPs) and obtained through site visits (see Annex G for site visits undertaken).
2. **Identification/description of environmental and social baseline (i.e., existing condition or affected environment)** based on a review of publicly available literature, documents provided by USAID and IPs, and field observations.
3. **Preparatory research and drafting of Scoping Statement sections.** In preparation for participatory scoping, the Assessment Team gathered and reviewed key literature and environmental documents, including documents provided by USAID/Honduras Mission staff, IPs, and consulted stakeholders.

The Assessment Team provided IPs with the draft Proposed Action section to confirm the actions and solicit input on completeness and organization. The Assessment Team revised the actions and re-organized the section consistent with the comments received.

4. **Development of an interview guide.** The Assessment Team developed an interview guide (see Annex J) to guide semi-structured interviews and stakeholder consultations and solicit or confirm information on proposed actions, existing conditions, potential issues, and feasible alternatives.
5. **One-on-one and group stakeholder meetings.** The Assessment Team held meetings in Tegucigalpa and during field visits in western Honduras (see Annex D for a list of stakeholders consulted).

The Assessment Team conducted one community consultation/community meeting to more broadly understand the affected environment and potential issues stemming from the Proposed Action.

6. **Field visits.** The Assessment Team conducted field visits to all departments (see Annex G. Field Visit Locations) in western Honduras. The field visits included the following:
  - a. Gathering information on and validating the Proposed Action
  - b. Validating information on existing conditions/affected environment
  - c. Identifying potentially significant impacts or issues that require further consideration during the PEA process
  - d. Identifying preliminary project alternatives (for evaluation in the PEA process)
  - e. Identifying issues that could be eliminated from the PEA process
7. **Consistency review of other USAID EAs in progress.** The USAID/Global Development Lab is conducting an EA for rainwater harvesting projects in southern Honduras. The Team Leader reviewed the Cosecha rainwater harvesting Scoping Statement and one team member is cross-staffed on the Cosecha EA.

The analysis phase for the PEA took place in November and December 2015 and January 2016.

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<sup>11</sup> This task was added following the in-briefing in Gracias on 24 September, when it was determined that the level of detail needed to meet USAID expectations for the PEA was greater than the information provided in Annex 3.

Based on the issues identified during the scoping phase, the Assessment Team developed the alternatives including (1) the current Proposed Action, (2) the No Action (i.e., the effects of not carrying out any action in western Honduras), and (3) to replace or supplement the Proposed Action and meet the project purpose and need described in Section 3 and respond to the issues identified in scoping.

The Assessment Team drafted alternatives, then, as part of the participatory process, the Assessment Team discussed alternatives with USAID and IPs and collected additional information for expanded baseline and analysis.

The Assessment Team analyzed the impacts of the Proposed Action, the Alternative, and the No Action Alternative based on updated information. The analyses compare the No Action Alternative, the USAID Proposed Action, and the Alternative identified for each proposed action with impacts. Where possible, components of the Alternative were considered individually if their design was only nominally reliant on other components. In addition to gross environmental impact, the analyses considered various risk factors including the likelihood, magnitude, area, and duration of impacts; and included mitigation actions, taking into account appropriate technology, cost-effectiveness, sustainability, and social and gender equity.

Given the integrative nature and close geographic focus of USAID's activities under DO2, the PEA identifies and evaluates the cumulative effects across these actions and activities. The PEA also addresses the consequences of impacts from activities over time and space, in combination with other activities or trends such as climate change, external social and political conflicts, and disasters.

Finally, the PEA describes best practices (from USAID sector environmental guidelines; lessons learned in Honduras, Latin America, and elsewhere; and other EAs and PEAs) for the mitigation of potential adverse impacts associated with the Recommended Action. These best practices are considered required mitigation measures for the selected action, and, as with all mitigation measures, must be included in IP contracts, EMMPs, and associated monitoring and evaluation plans.

The assessment was conducted through a combination of desk work and field work. In-country work conducted by the in-country members of the team included meetings with the government of Honduras (GoH) and NGOs and other meetings and phone calls needed to collect information to complete PEA analysis. The full Assessment Team participated in-country to finish information collection and conduct the PEA, agree on alternatives with USAID, and finalize the Scoping Statement and alternatives with IPs.

## 2. AFFECTED ENVIRONMENT

Consistent with 22 CFR 216(6)(c)(4) this section describes the environment of the area(s) to be affected or created by the alternatives under consideration—specifically the six western departments of Honduras. The intent of this section is to provide sufficient context for understanding the effects of the Proposed Action (described in Section 4) and, ultimately, the alternatives (discussed in Section 6).

### 2.1 POPULATION DYNAMICS AND ECONOMY

#### 2.1.1 POPULATION

As of 2015 Honduras' estimated population was 8.75 million, comprised of predominantly (90 percent) Mestizos (mixed Amerindian and white), 7 percent Amerindians, 2 percent Afrodescendants, and 1 percent of people of European origin (CIA, 2015). These racial groups can be further divided into seven different ethnic groups: (1) Spanish-speaking ladinos, (2) English-speaking criollos, (3) Garifunas (Afro-Antilleans composed of four indigenous groups); (4) Chorti (Mayan descendants), (5) Macro Chibcha (composed of four indigenous groups), (6) Uto Azteca or Nahua, and (7) Hoka-Sioux or Tolupan (USAID, 2008).

In 2014, the population growth rate was 1.68 percent, or an average of three children per woman. Population growth is generally higher in the rural areas of western Honduras than in urban areas. This population increase has negative environmental consequences resulting from a massive depletion of natural resources and inadequate infrastructure (GWP, 2011).

In 2011, 52.2 percent of the country lived in urban areas and the 2010–2015 population projections show an annual migration from rural to urban areas rate of 3.06 percent (GWP, 2011).

In 2013, there were approximately 3.5 million people in Honduras' workforce in three sectors: agriculture (14 percent), industry (28.2 percent), and services (57.8 percent). The principal exports in Honduras are, apparel, coffee, shrimp, automobile wire harnesses, cigars, bananas, gold, palm oil, fruit, lobster, and lumber (CIA, 2015).

TABLE 1. POPULATION OF WESTERN DEPARTMENTS

DEPARTMENT	DEPARTMENT CAPITAL	POPULATION (2001)	POPULATION (2010)	POPULATION CHANGE (%)
Copán	Santa Rosa de Copán	288,766	362,226	25.44
Intibucá	La Esperanza	179,862	232,509	29.27
La Paz	La Paz	156,560	196,322	25.40
Lempira	Gracias	250,067	315,565	26.19
Ocatepeque	Nueva Ocatepeque	108,029	132,453	22.61
Santa Bárbara	Santa Bárbara	342,054	402,367	17.63

Source: INE 2001 as cited in USAID 2014a

Western Honduras has six departments with a total of 19,827 km<sup>2</sup> representing approximately 18 percent of the country. Approximately 1.7 million people, of which 1 million are classified as extremely poor, reside in the region. The region's natural resources have been under increasing pressure due to relatively high population growth rates (2.2 percent per year) during the past 14 years, which has led to a relatively high population density of 87 people per km<sup>2</sup>, as compared to the national average of 74 people per km<sup>2</sup>. The department of Copán has the highest population density with 115 people per km<sup>2</sup>, while Intibucá and Lempira have the lowest with 74 and 75 people per km<sup>2</sup>, respectively (Table 2).

**TABLE 2. BASIC DEMOGRAPHIC AND SOCIOECONOMIC CONDITIONS FOR WESTERN HONDURAS**

DEPARTMENT NAME	AREA (KM <sup>2</sup> )	POPULATION (2001)	ESTIMATED POPULATION (2013)	POPULATION DENSITY (2013, PEOPLE/KM <sup>2</sup> )	HDI (2009)	MPI (2001)	MPI (2009)
La Paz	2,525	156,560	201,540	80	0.635	0.62	0.42
Santa Barbara	5,013	342,054	440,326	88	0.623	0.57	0.43
Copán	3,240	288,766	371,728	115	0.616	0.59	0.46
Ocatepeque	1,636	108,029	139,066	85	0.615	0.57	0.48
Intibucá	3,127	179,862	231,536	74	0.601	0.65	0.56
Lempira	4,286	250,067	321,911	75	0.587	0.67	0.61
<b>TOTAL</b>	<b>19,827</b>	<b>826,724</b>	<b>1,064,242</b>	<b>87</b>	<b>0.613</b>	<b>0.61</b>	<b>0.49</b>

Note: Population estimates 2013 based on actual growth rates from 2000 to 2010.

Sources: World Population Review. Rivera, et al., 2009. Multidimensional Poverty Index (MPI), United Nations Development Programme (UNPD), 2014 as cited in USAID 2014a.

## 2.1.2 ECONOMY

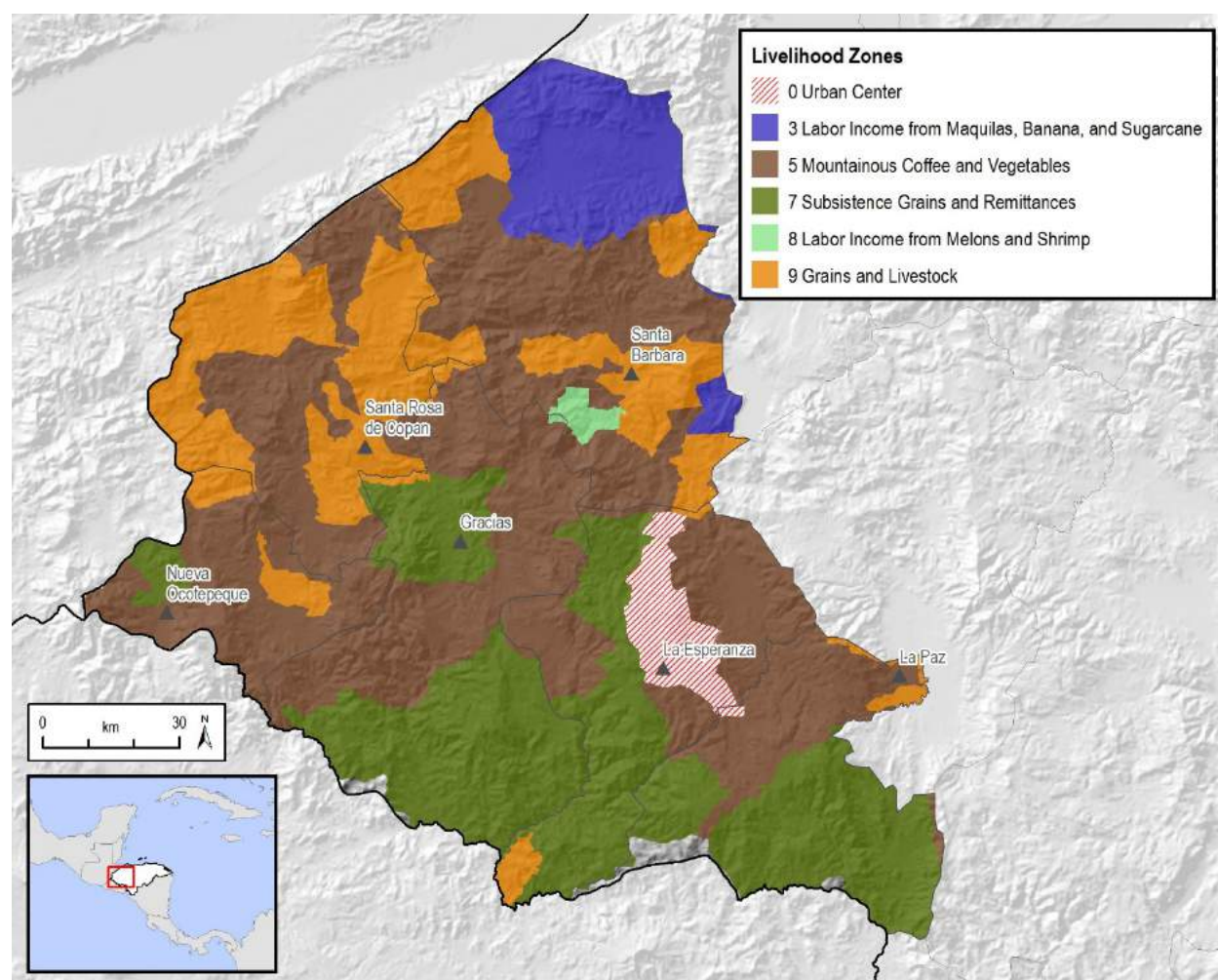
### LIVELIHOOD PROFILES OF WESTERN HONDURAS

Western Honduras has some of the highest rates of male employment in the country. Over 50 percent of the men employed in Copán, Intibucá, Lempira, and Ocotepeque work in agriculture (SS, INE, and ICF International, 2013).

Maize and beans, and to a lesser extent sorghum, are the principal basic grains that households grow for food and nutrition security. The most economically profitable crop is coffee, followed by horticultural crops, notably lettuce and potato. Figure 2 shows the main livelihood zones in western Honduras by geographic area, divided into four livelihood zones: maize, beans, and remittances; maize, beans, and livestock; wage labor; and coffee (FEWS NET, 2014).

According to census data from 2011, men aged 15–49 from departments in western Honduras are predominantly engaged in agriculture for their livelihoods (SS, INE, and ICF International, 2013). These percentages range from 50 percent in Santa Barbara to 82.7 percent in Lempira, with an average of 67 percent across the six departments in the region. Women also are heavily engaged in agriculture, ranging from 17.3 percent in Santa Barbara to 45.2 percent in Lempira. An assessment of women's empowerment in western Honduras revealed that 68.5 percent of the women in the sample were classified as disempowered, in comparison to 39.9 percent of the males.

FIGURE 2. LIVELIHOOD ZONES IN WESTERN HONDURAS



Source: FEWS NET, 2014

Table 3 lists the principal livelihood activities in each surveyed site. The livelihood in bold was considered the most important within each site. This information substantiates secondary data that coffee, maize and beans, and to a lesser extent, horticultural production, represent the predominant livelihood activities within the western Honduras region.

TABLE 3. LIVELIHOODS BY SUB-WATERSHED

MUNICIPALITY	DEPARTMENT	SUB-WATERSHED	MAIN WATERSHED	LIVELIHOODS*
Jesús de Otoro	Intibucá	Lower Río Grande de Otoro	Ulúa	<ul style="list-style-type: none"> <li>• <b>Rice, coffee, maize and beans,</b> horticultural crops (tomato, chile, watermelon)</li> <li>• Remittances</li> <li>• Cattle production</li> <li>• Forestry</li> <li>• Fruits</li> <li>• Carpentry, microenterprises, informal trade</li> </ul>

MUNICIPALITY	DEPARTMENT	SUB-WATERSHED	MAIN WATERSHED	LIVELIHOODS*
La Esperanza	Intibucá	Upper El Venado	Lempa	<ul style="list-style-type: none"> <li>• <b>Coffee, maize, beans,</b> potato, cabbage, lettuce, broccoli, carrots, cauliflower</li> <li>• Agricultural trade</li> <li>• Cattle production</li> <li>• Forest products (pine, annona, roble, charcoal production)</li> <li>• Tourism and handicrafts</li> </ul>
La Florida, Opatoro	La Paz	Upper Palagua	Goascorán	<ul style="list-style-type: none"> <li>• <b>Coffee, maize, beans,</b> household fruit production (orange, mango, lemon, avocado, banana, sapote, annona)</li> </ul>
San Antonio del Norte	La Paz	Lower Palagua	Goascorán	<ul style="list-style-type: none"> <li>• <b>Maize, beans, and sorghum</b></li> <li>• Cattle production</li> <li>• Sale of services (food, mechanic, carpentry, welding, masonry, transportation)</li> <li>• Sand and rock extraction for construction</li> <li>• Construction and sale of tiles and blocks</li> <li>• Forest products (firewood, wood for roofs)</li> <li>• Remittances</li> </ul>
Marcala	La Paz	Upper Río Grande de Otoro	Ulúa	<ul style="list-style-type: none"> <li>• <b>Coffee</b></li> <li>• Transport services</li> <li>• Microfinance</li> <li>• Remittances</li> <li>• Maize and beans</li> <li>• Cattle production</li> <li>• Microenterprises</li> <li>• Professional services for the government and projects</li> <li>• Construction</li> </ul>
Tomalá	Lempira	Lower Mocal	Lempa	<ul style="list-style-type: none"> <li>• <b>Maize and beans,</b> coffee</li> <li>• Cattle production</li> <li>• Tule cultivation</li> <li>• Soap</li> <li>• Dulce de panela</li> </ul>
San Marcos	Ocatepeque	Upper Higuito	Ulúa	<ul style="list-style-type: none"> <li>• <b>Coffee,</b> horticultural crops, maize and beans</li> <li>• Sand and rock extraction for construction,</li> <li>• Beekeeping,</li> <li>• Cattle production,</li> <li>• Agribusiness,</li> <li>• Recycling,</li> <li>• Rural tourism</li> <li>• Fruit production (pineapple, plantains, avocado)</li> <li>• Brickmaking</li> </ul>

MUNICIPALITY	DEPARTMENT	SUB-WATERSHED	MAIN WATERSHED	LIVELIHOODS*
Belén Gualcho	Ocatepeque	Upper Mocal	Lempa	<ul style="list-style-type: none"> <li>• <b>Horticultural crops, coffee</b>, maize and beans, trade (agricultural inputs, food)</li> </ul>

Source: USAID, 2014a.

\* The livelihood in bold was considered the most important within each site.

## POVERTY

Indicators such as high levels of poverty; high inequality; and uneven access to social services and economic opportunities have contributed to the stagnation of Honduras' Human Development Index (HDI) level, categorized as medium. Honduras has gradually improved its HDI, and in 2014, its HDI reached 0.617, ranking it 129 out of 187 countries. However, since 2012, the country's HDI has decreased slightly likely due to natural disasters, security concerns, and an unstable political climate (UNDP, 2014). Honduras ranks third among Latin American countries for education inequality, an indicator of income inequality, and has not improved literacy rates or achieved school enrollment rates greater than 53 percent.

Illiteracy also impacts economic development. About 68 percent of the total population in the region has full literacy, compared to the national rate of 85 percent (UNDP, 2014). The literacy rate by municipality varies, from 52 percent in Liure to 81 percent in the Caridad and San Lorenzo municipalities in the Valle department.

### 2.1.3 EDUCATION

In Honduras, access to education is highly varied, with wealthy and urban populations having significantly more access to education than rural or poorer citizens. While recent literacy data are not available for the specific department of western Honduras some conclusions can be inferred from urban/rural statistics since the departments are predominately rural.

**TABLE 4. LITERACY AND AVERAGE YEARS OF SCHOOLING (AYS) IN HONDURAS BY DEMOGRAPHIC**

CATEGORY	% ILLITERATE OVERALL	AYS OVERALL	% ILLITERATE MEN	AYS MEN	% ILLITERATE WOMEN	AYS WOMEN
Urban	6.6	9.0	6.2	8.8	7.0	9.1
Rural	20.5	6.1	20.0	6.0	20.9	6.2
Top Quintile	3.2	11.0	2.8	10.8	3.5	11.1
2nd Quintile	17.6	6.4	16.9	6.2	18.2	6.6
1st Quintile	23.7	5.6	23.6	5.5	23.7	5.7
Total	12.8	7.8	12.6	7.6	13.0	7.9

Source: INE, 2014

There is significant evidence that education has improved in the past couple of generations. However, in the western departments, serious educational challenges persist. Copán and Lempira have the highest population of uneducated women in the country, and in all six of the western departments the most common education level for women of childbearing age is of incomplete primary. Copán and Ocotepeque have the two highest rates of uneducated men in the country. Men with incomplete primary education also are the majority in Lempira, Copán, Intibucá, and Ocotepeque (SS, INE, and ICF International, 2013)

**TABLE 5. HIGHEST LEVEL OF SCHOOLING POPULATION PERCENTAGES IN WESTERN HONDURAS BY DEPARTMENT**

DEPARTMENT	NO FORMAL EDUCATION	PRIMARY		SECONDARY		UNIVERSITY	AVERAGE YEARS OF STUDY
		INCOMP.	COMP.	INCOMP.	COMP.		
Copán	10.8%	36.3%	21.2%	19.4%	7.7%	4.5%	5.1
Intibucá	5.9%	34.8%	33.1%	16.6%	6.6%	3.0%	5.3
La Paz	4.1%	31.9%	27.4%	21.0%	11.4%	4.3%	5.5
Lempira	9.2%	45.0%	27.0%	11.4%	5.1%	2.3%	4.4
Ocatepeque	7.3%	36.2%	25.3%	18.1%	9.0%	4.0%	5.3
Santa Bárbara	5.9%	30.1%	29.9%	21.3%	9.7%	3.1%	5.5
<b>HONDURAS TOTAL</b>	<b>3.9%</b>	<b>23.0%</b>	<b>27.1%</b>	<b>25.2%</b>	<b>12.8%</b>	<b>7.9%</b>	<b>5.8</b>

Source: SS, INE, and ICF International, 2013

Note: Incomplete = Incomp. and complete = Comp.

## 2.1.4 PUBLIC HEALTH

Public health in Honduras is in a state of transition. While many health indicators have improved over the past decade, Honduras lags behind its neighboring countries and there remain many significant barriers to health improvements (WHO, 2015).

### BIRTH AND FERTILITY

Fertility has rapidly declined from a total of five children per woman in 1989–1991 to 3.3 children per woman between 2000 and 2004 and 2.9 per woman in 2011–2012 (Pan American Health Organization, 2009; SS, INE, and ICF International, 2013). The fertility rate is above average in the west, with Lempira, Copán, and Intibucá having the second, third, and fourth highest fertility rates of the country (3.9, 3.6, and 3.6, respectively) (SS, INE, and ICF International, 2013).

Women in Honduras have children relatively young. The national average age of first birth for women is 20.3, which only slightly varies by education level (more education, older age of first birth), urban vs. rural (more urban, older age of first birth), and income (higher income, older age of first birth). Nationally, around 28 percent of women between the ages of 15 and 19 are already mothers, and this rate is even higher in western Honduras, in Copán that rate is 33 percent (SS, INE, and ICF International, 2013). This is likely the result of low use of contraceptives despite high rates of contraceptive awareness (SS, INE, and ICF International, 2013).

Infant mortality for 2006–2012 was 24 deaths for every 1,000 births, higher than the neighboring country averages, and maternal mortality was 290 deaths for every 100,000 births, again, above the regional average (SS, INE, and ICF International, 2013; WHO, 2015). Western Honduras has a slightly higher infant mortality rate than the national average, with rates in Copán, Intibucá, La Paz, and Lempira above 30 deaths for every 1,000 births.

The base of the population pyramid is still large, with 36 percent of the total population younger than 15 years old and 48 percent younger than 20 (SS, INE, and ICF International, 2013).

### BASIC NEEDS

Hondurans have almost universal access to potable water. However, the majority of the potable water systems are more than 12 years old and the distribution lines need repairs. Therefore, while the systems exist, operating conditions do not always assure quality, continuity, or adequate volumes. In western Honduras, like in the rest of the country, the largest group of Hondurans access their water through private plumbing

systems. The three departments with the highest percentage of drinking water access through both public and private plumbing (Intibucá, Lempira, and La Paz). In the more rural regions of Octopeque and Lempira, the use of wells is also common (SS, INE, and ICF International, 2013).

Homes in Honduras tend to be simple, especially in rural areas. In rural homes 52.6 percent of homes have a rudimentary floor (slab of concrete) and 31.5 percent have dirt floors, compared with 44.7 percent with rudimentary floors and 4.5 percent dirt floors in urban areas. Cooking is still largely done over wood stoves, 50 percent national average (22 percent for urban families, 81 percent for rural families), presenting risks for indoor air quality and fueling deforestation (SS, INE, and ICF International, 2013).

Adequate nutrition for children continues to be a problem in Honduras because most government and donor projects are focused on access and availability of food, but not on biological utilization and nutritional habits. Malnourishment is a more amplified problem in rural areas and in the west. Intibucá and Lempira have the highest rates of chronic malnourishment (both with 48 percent of children experiencing chronic malnutrition) followed by the departments of La Paz at 39 percent and Copán at 31 percent (SS, INE, and ICF International, 2013).

## 2.1.5 SECURITY

Honduras consistently ranks among the most violent and unsafe places in the world, largely due to the extent of organized crime (Institute for Economics and Peace, 2015). For decades Honduras has been embroiled in several civil wars and regime changes. Thus, Honduras is plagued with weak law enforcement and justice systems and is a favorite point of entry for drug traffickers (International Crisis Group, 2014). Drugs usually pass from Honduras into Guatemala, through the western departments, making them especially vulnerable to violence (International Crisis Group, 2014).

Honduras spends the seventh highest percentage of its GDP on violence containment (22 percent) in the world, which amounts to a total expenditure of \$8.36 billion (USD) or \$1,032 (USD) per person (Institute for Economics and Peace, 2015).

The homicide rate peaked in 2011–2012 when the national homicide rate was 86.5 and 85.5 per 100,000 people respectively (Instituto Universitario en Democracia, Paz y Seguridad [IUDPAS], 2012). Since 2012, the national homicide rate has decreased to 68 per 100,000 in 2014 (IUDPAS, 2015a). Nonetheless, Honduras still has the highest rate in the world.

In 2012, Copán and Octopeque were the 3rd and 4th most dangerous departments (based on homicide rates) (IUDPAS, 2012). Fortunately, like Honduras as a whole, the western region experienced a drop in the homicide rate since 2012. Now, the homicide rates in the west are below the national average of 68 homicides per 100,000, ranging from 66.5 percent in Copán to 23.2 percent in La Paz (IUDPAS, 2015a). While this is an improvement, western Honduras is hardly safe. If the region, which has an average homicide rate of 47.4 homicides per 100,000 inhabitants, were its own country, it would still have the third highest homicide rate in the world (after Honduras and Venezuela) (United Nations Office on Drugs and Crime, 2013).

According to police reports, other violent crimes are relatively common in Honduras. In 2014, there were an estimated 93 assaults and robberies a day. Reported robberies and assaults are relatively infrequent in western Honduras compared to other regions. Copán has the highest rate of assaults and robberies with 116 cases of non-violent robbery and 290 cases of violent robbery in 2014, while lowest Santa Barbara has the number of non-violent robberies in western Honduras with 28 assaults (92 violent robberies) and Lempira had the fewest violent robberies (6) not only in the region, but in Honduras (46 non-violent robberies) (IUDPAS, 2015a).

## GENDER AND SECURITY

Even though the most frequent victims of homicide in Honduras are men in their twenties, women face significant hardships in terms of safety. Fifty-three (53) percent of murders of women are motivated by gender (IUDPAS, 2015b).

Domestic violence is a common problem. Twenty-seven (27) percent of women in Honduras reported some form of abuse after the age of 15, and as women age, they are more likely to face violence, with 37 percent of women ages 45–49 reporting abuse. The rates in the western Honduras departments are lower than the national average, likely because domestic violence of girls appears to be less common in rural Honduras than in urban areas (SS, INE, and ICF International, 2013). Further, 60 percent of women have experienced some sort of physical violence from a partner. This rate is even higher among divorced women or women separated from their partners (77 percent and 80 percent respectively) (SS, INE, and ICF International, 2013).

Sexual violence is likely under reported in Honduras, as it is globally, however, the national census found that 3 percent of women in Honduras have experienced sexual violence in the past year alone (SS, INE, and ICF International, 2013).

## 2.2 NATURAL RESOURCES, ECOSYSTEMS, AND ECOSYSTEM SERVICES

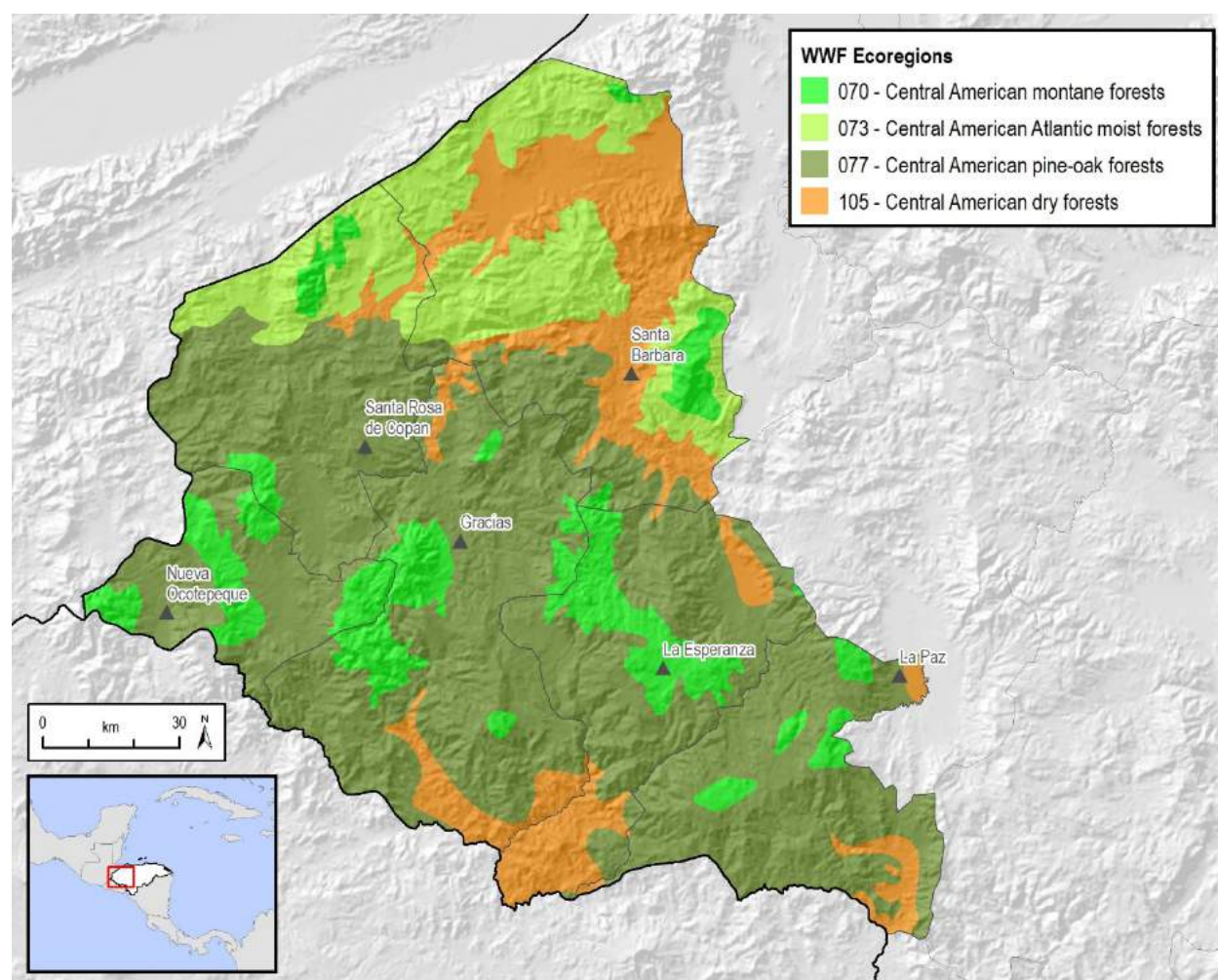
### 2.2.1 ECOSYSTEMS

The ecosystems in western Honduras are characterized by forest. Figure 3 shows the World Wildlife Fund ecosystem classifications (with Food and Agriculture Organization of the United Nations-The Nature Conservancy [FAO-TNC] designations in parenthesis):

- montane forest (tropical and sub-tropical moist broadleaf)
- moist forest (tropical and sub-tropical moist broadleaf)
- pine-oak forest (tropical and sub-tropical coniferous)
- dry-forest (tropical and sub-tropical broadleaf)

These ecosystems, however, have been substantially disrupted in some areas and are now characterized by high-mountain grassland and agricultural uses.

FIGURE 3. ECOREGIONS IN WESTERN HONDURAS



Source: World Wildlife Fund

## LEGAL PROTECTION OF THE ENVIRONMENT AND ECOSYSTEMS

A number of laws focused on environmental protection and economic growth make up the national regulatory framework for sustainable development in Honduras. Such laws include the Ley General del Ambiente (General Environmental Law), Ley de Agua de 2009 (the Water Law of 2009), Ley Forestal (Forestry law), Áreas Protegidas y Vida Silvestre del 2008 (Protected Areas and Wildlife Act of 2008), Ley de Ordenamiento Territorial (Territorial Law Code of 2008), la Ley de Gestión de Riesgos (Risk Management act), la Ley de Promoción a la Generación de Energía Eléctrica con Recursos Renovables (Act on Promotion of Electricity Generation by Renewable Resources), and la Ley Especial de Educación y Comunicación Ambiental del 2009 (the 2009 Special act on Environmental Education and Communication).

Honduras has also been active in international negotiations since the early 1990s, and had some success in following through on their commitments. Specifically, the Office of the Public Prosecutor for the Environment, and the Border Police, helped reduce Honduras' consumption of substances that deplete the ozone decreased dramatically after signing the Montreal Protocol on Substances that Deplete the Ozone.

Other international agreements Honduras is party to include the International Convention on Biodiversity (1995), the United Nations Framework on Climate Change (1995), The United Nations Convention to Combat Desertification (1997), the Ramsar Convention (Convention on Wetlands, 1992), The Stockholm Convention on Persistent Organic Pollutants (2002), and the Vienna Convention on the Protection of the Ozone Layer (1993).

## 2.2.2 FOREST

Forested area in Honduras has decreased considerably in the last 25 years. In 1990, the forested area of Honduras was estimated to be 72.32 percent, and dropped to 51.48 percent in 2005, and 43.2 percent in 2013 (UNDP, 2012). Every year, between 34,000 and 58,000 hectares of forest are lost to forest fires, disease, the expansion of agricultural and grazing lands, and to the illegal timber trade.

As of 2013, only 54,000 km<sup>2</sup> are indeed forested, which is equivalent to 43.2 percent of the total land cover of Honduras (ICF, 2013; World Bank, 2015). According to the Instituto de Nacional de Conservación Forestal y Vida Silvestre (ICF), forests are distributed among the following forest types:

- 57.5 percent broad-leaved deciduous forest
- 36.3 percent conifer forest
- 5.3 percent mixed forest
- 1.0 percent mangrove

The amount and type of forested land in western Honduras varies greatly by department (Table 6).

**TABLE 6. FOREST AREA IN WESTERN HONDURAS BY DEPARTMENT**

DEPARTMENT	AREA (1000 HA)	TROPICAL RAINFOREST (HA)	DECIDUOUS FOREST (HA)	MIXED FOREST (HA)	DENSE CONIFEROUS FOREST (HA)	SPARSE CONIFEROUS FOREST (HA)	TOTAL FOREST AREA (HA)	FOREST AREA %
Copán	324	22,656	9,381	5,805	30,414	10,582	78,838	24.32
Intibucá	312	25,218	41,335	19,935	62,936	11,466	160,890	51.52
La Paz	233	4,884	15,560	15,052	47,588	27,338	110,422	47.37
Lempira	420	13,506	32,315	26,353	70,277	19,226	161,677	38.48
Ocatepeque	163	9,849	1,546	4,642	18,681	10,872	45,590	27.97
Santa Bárbara	487	48,215	31,074	7,943	62,248	9,621	159,101	32.68
<b>TOTAL</b>	<b>1,940</b>	<b>124,328</b>	<b>131,211</b>	<b>79,730</b>	<b>292,144</b>	<b>89,105</b>	<b>716,518</b>	<b>36.94</b>

Source: ICF, 2014; Programa REDD/CCAD-GIZ, 2014

## 2.2.3 BIODIVERSITY AND PROTECTED AREAS

The Western Region has 23 out of 51 ecosystems found throughout the country (USAID, 2014b). Two groups of ecosystems that are not found in other regions of the country are found in the Western region: submontane broadleaf evergreen seasonal forest (in the Copan valley) and remnants of dry forests (deciduous shrublands and semi-deciduous forests) mainly located in the valleys of Jesus de Otoro, La Paz, Quimistán, Santa Barbara, Sesecapa and Sensenti (House and Midence, 2007).

The Honduran ecosystems richest in endemic species are the dry forests and the cloud forests. The western region has both types of ecosystems and therefore the number of endemic species in the region is high for both amphibians and plants (USAID, 2013).

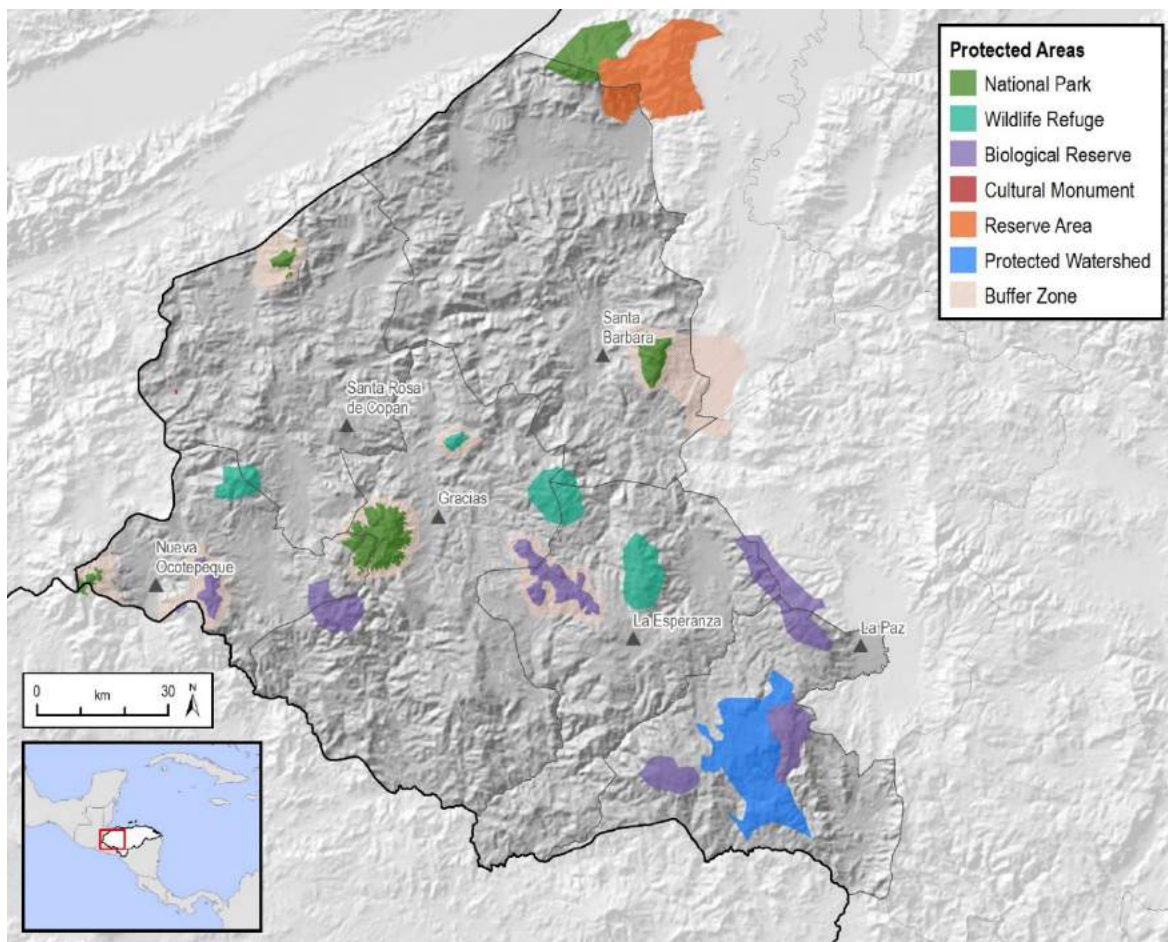
The region reports a total of 36 plant species endemic to Honduras, 1 species co-endemic with El Salvador, one endemic to Central America, and 3 endemic to the Mesoamerican region. Four amphibian species endemic to Honduras are reported in the western region as well as another 4 co-endemic with Guatemala and El Salvador, all of them (8) with very small populations and under critically endangered condition according to the International Union for the Conservation of Nature (IUCN) Red List, which means that they are at an extremely high risk of extinction in the wild. In the group of birds, the region stands out by the presence of the Honduran Emerald Hummingbird (*Amazilia luciae*), the only endemic bird species to Honduras, critically endangered according to IUCN Red List, and reported in the buffer zone of Celaque National Park and other

sites in the region but outside protected areas boundaries (in the department of Santa Barbara). Additionally, pine-oak forests of the western region serve as winter habitat for Golden Cheeked Warbler (*Dendroica chrysoparia*), a migratory bird that is endangered according to the IUCN Red List (SERNA, 2008) and facing a very high risk of extinction or decline of wild populations. In western Honduras this species is mainly reported outside protected areas within Intibucá department (USAID, 2013).

To protect Honduras' biological richness, its cultural heritage, and many ecosystems services that undeveloped land offer, the government has established the Sistema Nacional de Áreas Protegidas de Honduras (SINAPH).

These protected areas are defined as areas set-aside by law for the purposes of conservation, protection of natural resources, and protection of cultural resources. Geographic, anthropologic, biotic, social and economic factors help determine whether or not a site is designated as a protected area.

**FIGURE 4. PROTECTED AREAS IN WESTERN HONDURAS**



Source: ProParque

## MANAGEMENT

A variety of municipalities, multinational organizations, NGOs, academic institutions, and national ministries manage the nearly four million hectares of protected land. Many of the protected areas are part of co-management agreements between governments and communities, usually involving NGOs.

The most relevant national regulatory bodies include:

- ICF, via the Departamento de Áreas Protegidas (DAP), is responsible for the execution of forestry policies, coordinating with involuntary actors in the system, and leading the implementation of conservation plans and strategies.
- The Ministry of Energy Natural Resources Environment and Mines (SERNA/Mi Ambiente) is responsible for designing and implementing environmental policies and norms for the country and for coordinating the implementation of international agreements related biodiversity through the Dirección General de Biodiversidad (DIBIO).
- Instituto de Turismo (IHT).
- Dirección General de Pesca (DIGEPESCA).
- Secretaría de Agricultura y Ganadería (SAG).
- Instituto de Antropología e Historia (IAH).
- Secretaría de Planificación (SEPLAN).
- Instituto de la Propiedad.

Other important bodies include local governments, civil society through NGOS, grassroots organizations, and Consejos Consultivos (Velásquez, 2013).

## LEGAL STATUS

Declaring protected areas does not indicate any condition of dominion or ownership, but rather subjects the land or land owners/those with property rights to restrictions, limitations, and obligations that are necessary to achieve the public use goals of the protected area (Article 64 of *Ley Forestal de Honduras*).

Protected areas are declared by the executive branch or the national congress through the ICF or by the petition of a body of municipalities or communities. This petition is subject to legal disposition norms and subject to technical and scientific studies (Article 64 of *Ley Forestal de Honduras*).

## PROTECTED AREAS IN WESTERN HONDURAS

In the six departments in the west of Honduras, there are 21 protected areas comprised of 10 biological reserves, five national parks, four wildlife reserves, one natural monument, and one cultural monument. This amounts to 26.59 percent of the forested area in western Honduras. Of these parks, all were founded by Congressional Decree and 33 percent are co-managed (Velásquez, 2013).

TABLE 7. PROTECTED AREAS IN WESTERN HONDURAS BY DEPARTMENT

TYPE	NAME	DEPARTMENT	HECTARES	COMANAGED	
				YES	NO
National Park	PN Trifini–Montecristo	Ocatepeque	8,277	X	
	PN Celaque	Lempira–Copán y Ocatepeque	26,666	X	
	PN Cerro Azul Copán	Copán	12,083	X	
	PN Montaña de Santa Bárbara	Santa Bárbara	13,951		X
Biological Reserve	RB San Pedro	La Paz			
	RB San Pablo	La Paz			
	RB El Pacayal	La Paz			

	RB El Pital	Ocotepeque	2,677		X
	RB Cerro Volcán Pacayita	Lempira y Ocotepeque	10,249		X
	RB Guisayote	Ocotepeque	14,081	X	
	RB El Chiflador	La Paz	596		
	RB Opalaca	Intibucá y Lempira	25,892	X	
	RB Guajiquiro	La Paz	11,490		X
	RB Montecillos	Comayagua y La Paz	20,333		X
Wildlife refuge	RVS Erapuca	Copán–Ocotepeque	6,522		X
	RVS Montaña de Puca	Lempira	5,466		X
	RVS Mixcure	Intibucá	12,689	X	
	RVS Montaña Verde	Lempira, Intibucá y Santa Barbara	7,211		X
Monuments	MN Congolón Coyocutena	Lempira	11,019	X	
	MC Ruinas de Copán	Copán	1,297		X
TOTAL			190,499		

Source: IFC/DAP 2009

## PARQUE NACIONAL MONTAÑA DE CELAQUE

Parque Nacional Montaña de Celaque (PNMC) is an important cultural and natural site in Honduras. The PNMC was the site of the last outpost of indigenous resistance during the Spanish conquest. The current inhabitants are mostly of indigenous Lenca heritage, and have been able to conserve many of their pre-Columbian traditions. These traditions are uniquely suited to the local environment and maintain ecological balance, allowing the PMBNC to be one of the few protected areas in the west that maintains ecological and environmental stability through co management with local communities.

Biologically, the PMNC contains diverse ecosystems, including cloud forests to tropical rain forests (Hondubirding, 2008). The PMNC protects a number of endemic species including a salamander (*Bolitoglossa celaque*), and a plant (*Oreopanax lempiriana*) and endangered species such as the Quetzal, road runner, Oncilla, tigrillo, ocelot, several species of monkey, and flying squirrels. Within the park, 269 species of birds, 45 species of mammals, and 29 species reptiles and amphibians have been reported (MOCAPH, undated).

Further, the PNMC is an important water source as the headwaters to the supply for 120 communities within and near its borders. There are over 50 springs in the area, and 10 micro-watersheds that form the Ulúa River and also feed into the Mocal River and Lempa River, the main river of El Salvador (MOCAPH, undated).

## MANAGEMENT

In 2010, 11 municipalities with jurisdiction and influence over the PMNC signed a convention of co-management forming La Mancomunidad de Municipios del Parque Nacional Montaña de Celaque (MAPANCE).

In the center of the park, 458 families of Lenca descent live 1,800 meters above sea-level—which delineates the border for the nucleus zone of the park. They practice mostly subsistence agriculture, growing grains, fruits, and some minor horticulture. However, their livelihoods and the integrity of the forest are threatened by the encroaching coffee plantations in the park and the buffer zone.

## REDEFINITION OF THE PARK BORDER

To address this issue, MAPANCE (with USAID support through ProParque) has introduced legislation that will allow the families living in the center of the park to redefine the limits of the buffer zone to allow them to carry out their agricultural practices. This plan faces significant barriers as such a change in land use changes in the Ley Forestal that can only be made by the national congress.

## BIRDS

An estimated 765 species of birds can be found in Honduras. Migratory birds make up roughly 25 percent of the total. Migratory birds typically arrive from August to October and return north in March or April. Birds are the most numerous of the vertebrate species in Honduras and can be found in a large range of habitats including cloud forests, rain forests, deciduous forests, coniferous forests, scrub forests riparian habitats, and lakes and lagoons. They consume a wide range of food types including seeds, insects, fruits and carrion. Birds are responsible for controlling a wide range of insects, including those crop pests. They can also however, also consume large quantities of farmer seed crops. Seed crop eaters include blackbirds and grackles which can arrive in large numbers and decimate some crops. Large birds including hawks, eagles, vultures and falcons can be killed by wind generating equipment (Thorn, 2015).

## 2.2.4 SOIL RESOURCES AND LAND USE

While nearly half of Honduras' land is forested, the agricultural sector takes up a large portion of Honduras' land use.

Though Honduras is well suited for agriculture, as recently as the mid-1980s less than half of the country's cultivatable land was planted with crops. Most was used for pastures or was forested and owned by the government or banana corporations. Meanwhile, much of the land within the ecoregions (Caribbean Mangroves, Moist Forests, Dry Forests, Montane Forests, Pine Oak Forests, Pacific Mangroves, and Meskito Pine Forests) has been significantly deforested for commercial and subsistence agriculture (Churchill and Dobrowolski, 2002).

The percentage of land used for agriculture in Honduras is currently 12.98 percent of the total surface area of the country. This percentage is divided into arable land (9.07 percent) and permanent crops (3.91 percent). Irrigated land in Honduras covers an area of 875.5 km<sup>2</sup>, while lands used for other purposes represent 87.02 percent of the country's area (CIA, 2015).

As indicated in Table 8, pine forests (32 percent) and broadleaf forest (26 percent) dominate permanent land cover in the western Honduras region, while agriculture and shrublands make up the remainder (40 percent). Broadleaf forest is a critical part of the ecosystem in western Honduras. Much of the region's broadleaf forests are located at higher elevations (1,600 meters above sea level), which make up western Honduras' cloud forests that are a critical source of the region's water resources. Western Honduras' 21 protected areas, which account for 13.3 percent of the region's total land area, contribute a significant portion of the region's permanent land cover.

TABLE 8. LAND COVER AND LAND USE IN WESTERN HONDURAS

LAND COVER/LAND USE	AREA (KM <sup>2</sup> )	AREA (%)	PLCI (%)
Irrigated Agricultural Areas	66	0.3	Unknown
Rain-fed Agricultural Areas and Pasture	5,061	23.1	Unknown
Urban Areas	6	0.0	Unknown
Broadleaf Forest	5,635	25.7	26
Mixed Forest	439	2.0	2
Dense Pine Forest	4,070	18.5	19
Sparse Pine Forest	2,912	13.3	13

LAND COVER/LAND USE	AREA (KM <sup>2</sup> )	AREA (%)	PLCI (%)
Water Bodies	86	0.4	Unknown
Shrublands	3,670	16.7	Unknown
<b>TOTAL</b>	<b>21,944</b>	<b>100.0</b>	<b>60</b>

Source: USAID, 2014a

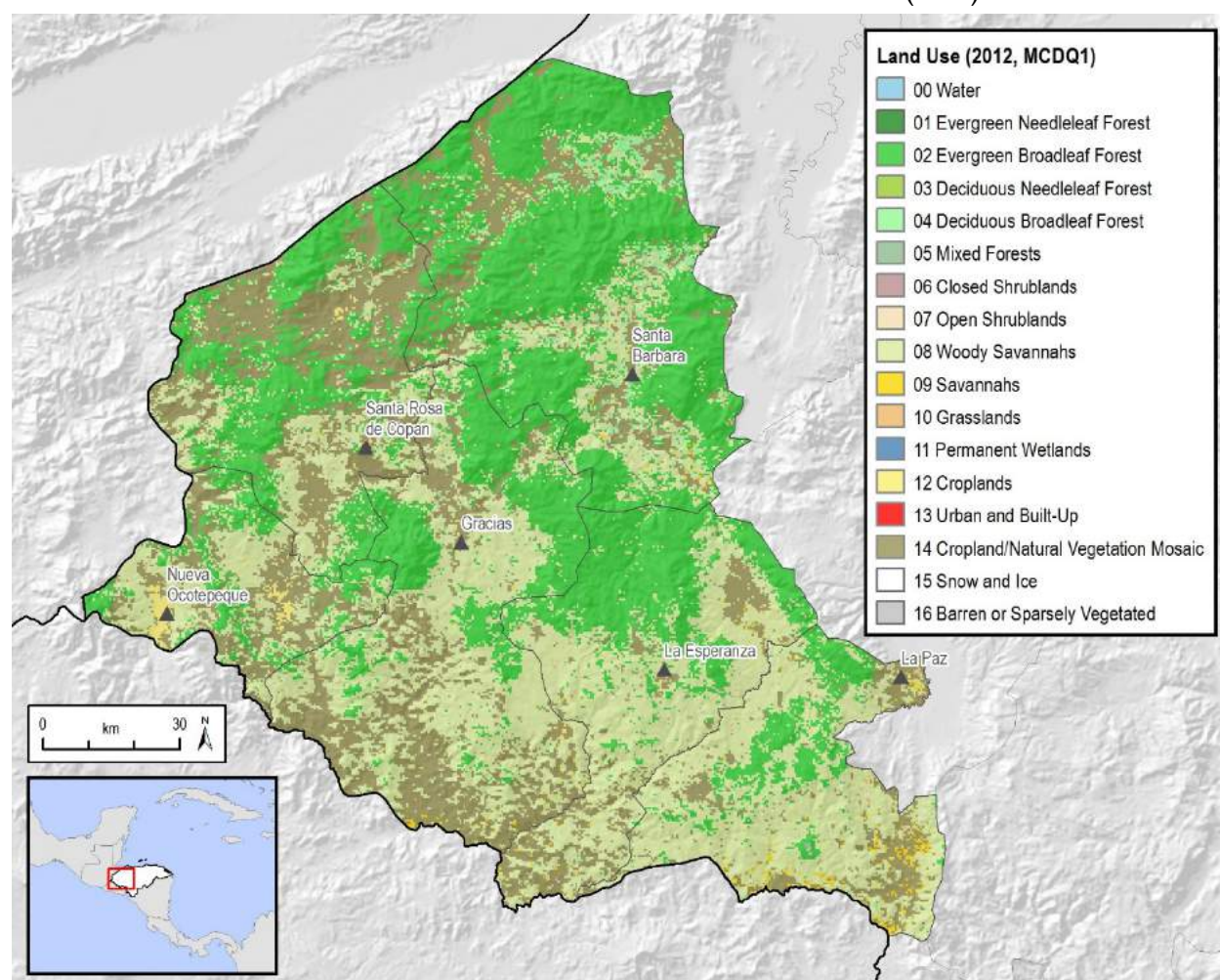
Table 9 provides an analysis of permanent land cover using the U.S. Geological Survey (USGS) permanent land cover index (PLCI) in western Honduras by department. Despite western Honduras' relatively high overall permanent land cover as compared to other regions, the PLCI varies considerably among departments within the region. For example, the departments of Intibucá and La Paz have slightly higher PLCIs of 67 percent and 66 percent, respectively, while Copan and Lempira have lower PLCIs of 51 percent and 53 percent, respectively. It is important to note that the high PLCI for the region is likely positively influenced by the effect of coffee production, as coffee is a permanent crop that is cultivated extensively throughout western Honduras. However, it is not possible to accurately assess the magnitude of this effect, as coffee is not separated in existing land cover classification data.

**TABLE 9. PERMANENT LAND COVER DISTRIBUTION AMONG DEPARTMENTS IN WESTERN HONDURAS**

RANK	DEPARTMENT	AREA (KM <sup>2</sup> )	PERMANENT LAND COVER LAND USE (KM <sup>2</sup> )	PLCI (%)
1	Intibucá	3,127	2,102	67
2	La Paz	2,535	1,668	66
3	Ocatepeque	1,636	948	58
4	Santa Bárbara	5,013	2,786	55
5	Lempira	4,286	2,251	53
6	Copan	3,240	1,659	51
	<b>TOTAL</b>	<b>19,837</b>	<b>11,414</b>	<b>60</b>

Source: USAID, 2014a

FIGURE 5. LAND COVER AND LAND USE FOR WESTERN HONDURAS (2012)



Source: USGS MODIS MCD 12Q1

TABLE 10. LAND USE IN HONDURAS

LAND USE TYPES	LAND USE CATEGORIES	AREA (KM <sup>2</sup> )	AREA (HA)	% OF AREA
Forest	Tropical Rainforest	25,787.3	2,578,729.0	22.92%
	Deciduous Forest	5,191.2	519,116.2	4.61%
	Mixed Forest	2,844.7	284,473.8	2.53%
	Dense Conifer Forest	12,406.1	1,240,609.2	11.03%
	Sparse Conifer Forest	7,199.0	719,901.9	6.40%
	Tall Mangrove	331.0	33,102.2	0.29%
	Short Mangrove	184.8	18,476.0	0.16%
	Flooded Tropical Rainforest	37.3	3,729.1	0.03%
	SUBTOTAL FOREST	53,981.4	5,398,137.3	47.99%
Agroforestry	Coffee	2,434.1	243,405.5	2.16%
	SUB TOTAL AGROFORESTRY	2,434.1	243,405.5	2.16%

LAND USE TYPES	LAND USE CATEGORIES	AREA (KM <sup>2</sup> )	AREA (HA)	% OF AREA
Agriculture	Industrial	1,009.9	100,985.3	0.90%
	Small Scale Cultivation / Pasture	31,560.3	3,156,028.8	28.06%
	African Palm	1,214.5	121,447.1	1.08%
	Shrimp / Salt Farms	179.5	17,951.1	0.16%
	<b>SUB TOTAL AGRICULTURE</b>	<b>33,964.1</b>	<b>3,396,412.4</b>	<b>30.19%</b>
Other Uses	Secondary Growth Rainforest	7,220.6	722,057.5	6.42%
	Secondary Growth Deciduous	5,932.9	593,287.6	5.27%
	Grassland	3,208.2	320,818.8	2.85%
	Continuous Urban Zones	470.2	47,017.1	0.42%
	Interrupted Urban Zones	437.6	43,756.8	0.39%
	Sandy Beach	33.8	3,378.6	0.03%
	Bare Continental Soil	312.2	31,218.3	0.28%
	Humid Continental Area	962.6	96,262.7	0.86%
	Tique ( <i>Acoelorrhaphe wright</i> )	214.2	21,423.4	0.19%
	Non-Forest Trees	1,600.3	160,027.9	1.42%
	<b>SUB TOTAL OTHER USES</b>	<b>20,392.5</b>	<b>2,039,248.7</b>	<b>18.13%</b>
Bodies of Water	Naturally Occurring Lakes and Ponds	1,449.4	144,938.5	1.29%
	Man-Made Bodies of Water	89.9	8,986.9	0.08%
	Other Bodies of Water	180.7	18,070.7	0.16%
	<b>SUB TOTAL BODIES OF WATER</b>	<b>1,720.0</b>	<b>171,996.1</b>	<b>1.53%</b>
<b>TOTAL</b>		<b>112,492.0</b>	<b>11,249,200.0</b>	<b>100.00%</b>

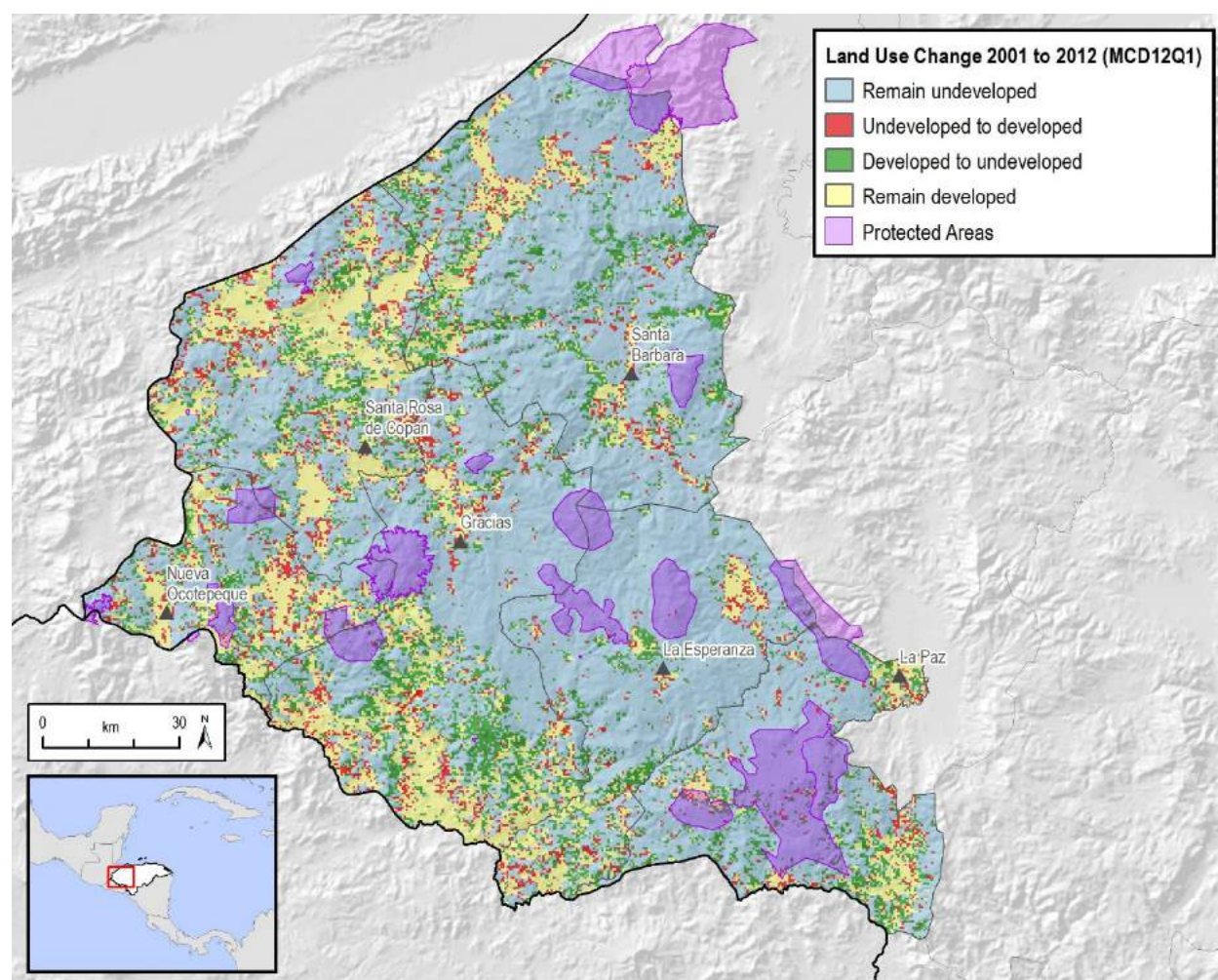
Source: ICF, 2014

Of the agricultural sector, land can be separated into and traditional agriculture/livestock (intermixed with secondary vegetation and villages) comprising 28 percent of Honduran Land use, coffee plantations comprising 2.2 percent, African Palm plantations, representing 1.08 percent of overall land use, and other industrial agriculture (vegetables, grains, fruits, others) representing 0.9 percent of total land use (ICF, 2013).

### LAND USE IN WESTERN HONDURAS

Western Honduras is slightly less forested than the national average, with 36.94 percent of the land designated as forest. There is severe deforestation pressure, especially on deciduous forest and coniferous forest above 1800m (where coffee is typically grown). These high-elevation forests contain several threatened or endangered species, and face further danger with the rapid increase of coffee cultivation. Deforestation and encroachment on protected areas can be seen as the red dots in Figure 6. Land Use Change 2001 to 2012, which indicate a change in land cover from undeveloped land to developed land between 2001 and 2012. Limitations do exist to using satellite data for land use change analysis, however. For example, land use change from forest to grasslands can be classified with greater precision than a change from virgin forest to shade grown coffee. Figure 6 also shows some afforestation (conversion from grasslands to forest), which may indicate a transition to agroforestry, including shade-grown coffee. Between 2014 and 2015, coffee exportation increased by 21 percent (ICF, 2014; Ordonez, 2015). The extent to which this is shade grown versus open canopy coffee has substantial implications for limiting the degradation of forest ecosystems.

FIGURE 6. LAND USE CHANGE 2001 TO 2012



Source: USGS MODIS MCD 01 and 12Q1

President Juan Orlando Hernández recently initiated the Programa para la Producción Sostenible de Café, symbolically planting the first 100,000 plants of the million that will be part of the renovation of the coffee plantation managed by Cadelga and Co. Honducafé.

Other land uses can be best broken-down by the La Secretaría de Agricultura y Ganadería (SAG) sub-regions, based on geographic, soil, topography and slope, forest, population, and the primary crops of the area.

#### WESTERN DEPARTMENTS (LEMPIRA, OCTOPEQUE, COPÁN)

As shown in Figure 7, the elevation of the westernmost departments ranges 600 to 2500m above sea level, with 97 percent of the region is characterized by steep hills and mountains (DICTA-SAG, 2015).

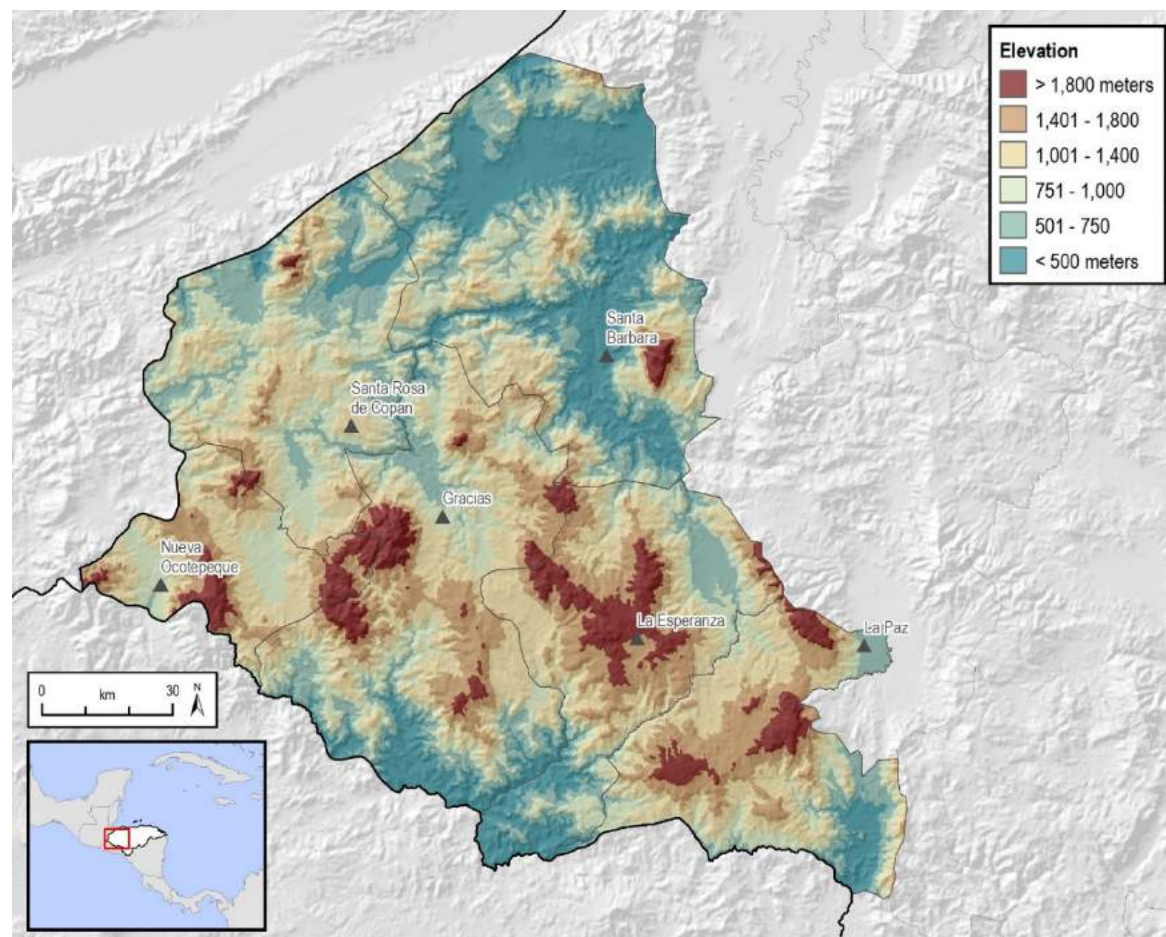
The flat areas of this sub region are concentrated in Ocotepeque and Copán, and are largely dedicated to cattle ranches. In these areas, the continuous felling of trees due to the constant pressure from the local population for land and exploitation of forestry resources has resulted in erosion and loss of soil fertility.

The forested area in Ocotepeque and Copán is significantly lower than in Lempira (24 percent, 28 percent, and 52 percent of land cover, respectively). Both pine and deciduous trees are under significant deforestation pressure from both the expansion of cultivated land and the harvesting of timber (DICTA-SAG, 2015).

In these departments, 90 percent of the population is classified as rural and faces significant disadvantages.

The average illiteracy rate is almost 60 percent, and in some municipalities is as high as 80 percent. The residents of these rural own little land (between 0.7 and 2.0 hectares in the majority of cases) and generally partake in subsistence and migratory agriculture (DICTA-SAG, 2015).

**FIGURE 7. ELEVATION IN WESTERN HONDURAS**



## **SANTA BÁRBARA**

Agriculture in Santa Bárbara includes large-scale irrigation. It is characterized by an extensive and fertile valley to the north of the department. The valley is home to industrial plátano, grapefruit, timber, pasture, maize, vegetables, and pineapple. Nonetheless, the most important crop in Santa Bárbara is coffee, taking up an area of 54,000 manzanas which is home to 13,550 producers who send 570,000 quintals to market each year. Santa Bárbara also grows for export 2,000 quintals of black pepper and 120,000 tons of sugar cane each year (DICTA-SAG, 2015).

## **LA PAZ AND INTIBUCÁ**

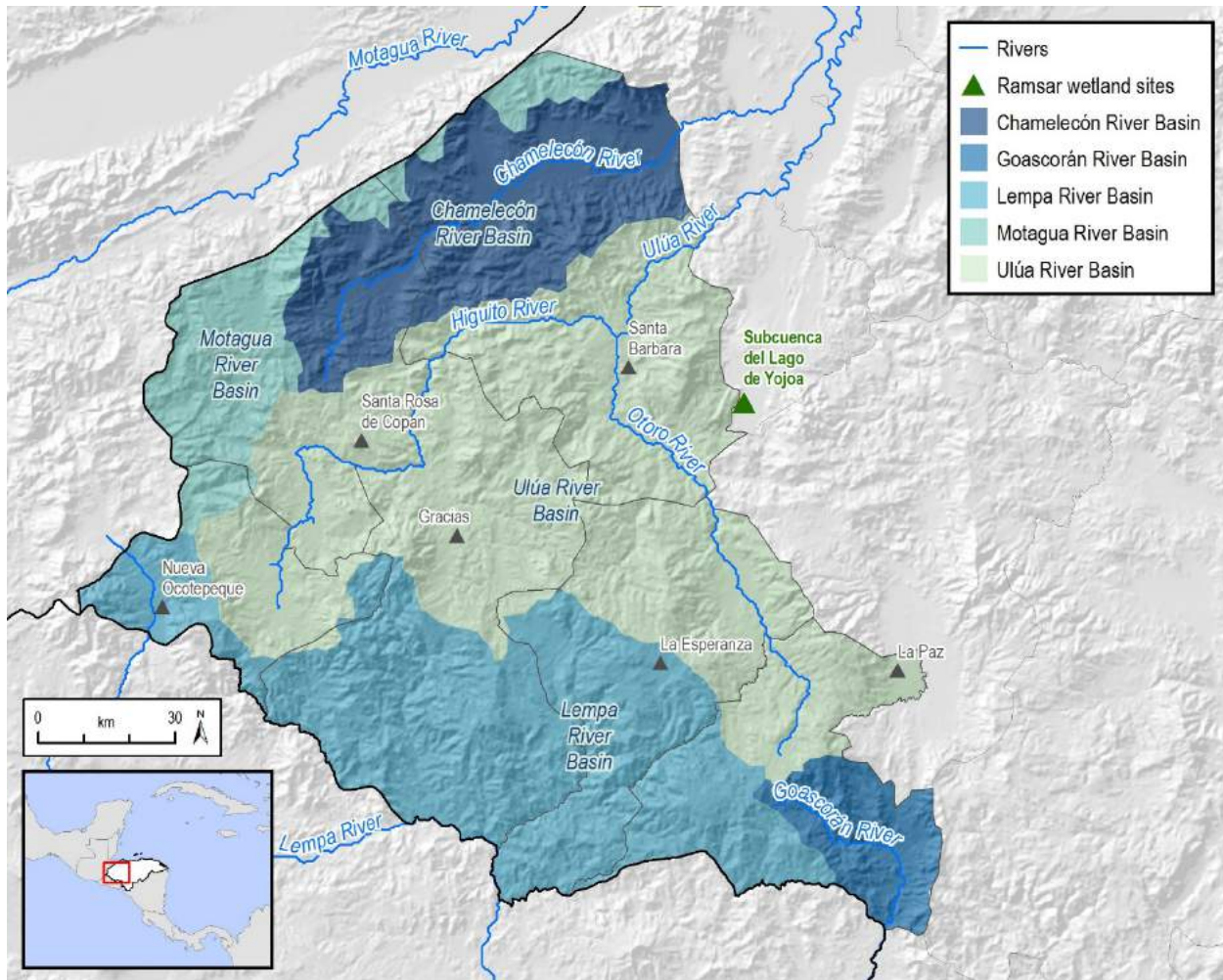
Coffee is the most economically important crop in northern La Paz but the region also boasts a diverse portfolio of other produces including basic grains (maize, rice, beans, soy, sorghum); vegetables (chile, tomato, onion, cabbage, pepper, squash, broccoli, sweet potato, cauliflower, lettuce); and flowers (carnations, orchids). The region is also known for growing vegetables for export and a variety of fruits ranging from mango and guava to plantain (DICTA-SAG, 2015).

## **2.2.5 WATER RESOURCES AND WATERSHED MANAGEMENT**

Nationwide Honduras is divided on 19 main watersheds with around 100,000 Hm<sup>3</sup> of water annually (GWP, 2011). Five of the watersheds are on the Western zone: Motagua, Chamelecon, Ulua, Lempa, and Guascoran

(USAID, 2014a). The last two drain to the Pacific and the rest to the Atlantic. Three of them are transboundary watersheds, Motagua with Guatemala, Lempa with Guatemala and El Salvador and Guascorán with El Salvador. Ulua River is the second river on water volume magnitude, however not all the watershed is on western Honduras. Figure 8 shows Honduras' major river watersheds and Table 11 describes their main characteristics.

**FIGURE 8. MAJOR RIVERS AND WATERSHEDS IN WESTERN HONDURAS**



Source: USAID, 2014a

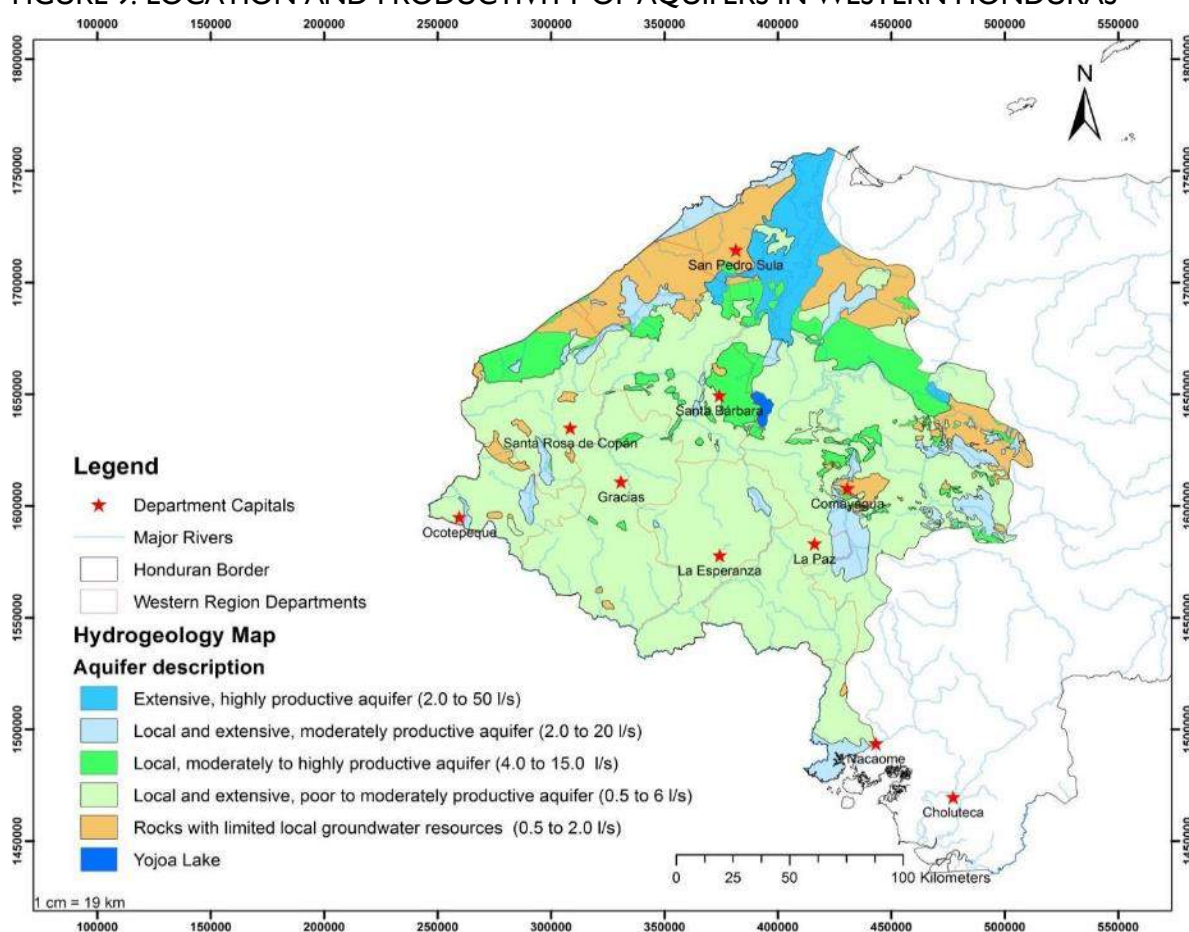
TABLE 11. MAIN WATERSHEDS IN WESTERN HONDURAS

WATERSHED	AREA (KM2)	VOLUME (10 <sup>6</sup> m <sup>3</sup> /YEAR)	SLOPE (%)	MEAN RAINFALL (mm)	MEAN PTE (mm)
Río Motagua	2,166	2,072	-	1,593	1,228
Río Chamelecón	4,427	3,264	0.47	1,526	1,302
Río Ulua	22,817	16,959	0.42	1,477	1,257
Río Lempa	5,288	3,872	2.67	1,804	1,302
Río Goascorán	1,564	1,200	1.24	1,813	1,436

Source: Balairón et al., 2003; SAIGUA, undated.

Because the western region is predominantly mountainous and the occurrence of aquifers depends largely on geological formation and topography, groundwater sources are limited, likely occurring along major rivers crossing intermountain valleys that have been formed by sediment deposits. Figure 9 shows the location and the estimated productivity of the aquifers.

FIGURE 9. LOCATION AND PRODUCTIVITY OF AQUIFERS IN WESTERN HONDURAS



Source: USAID, 2014a

Water use in Honduras is generally less than 10 percent of what is available. Less than 10 percent of available water is groundwater and of the groundwater that is used 90 percent is used for irrigation (GWP, 2011).

Honduras has a great potential for hydropower generation. In 2013, roughly 502 MW (33 percent) of the installed capacity of the national interconnected system came from hydro plants. “There has been an intensive

use of small- and medium-scale hydro energy, the majority of existing hydro plants with capacity below 30 MW. Two large plants, Cajon and Lindo (both outside western Honduras), provide more than 70 percent installed capacity” (3Power Energy Group, 2011). The same source indicated that sixteen new projects are planned or under construction, to provide other 206.5 MW.

The institutional framework around water is being developed on an ongoing basis since the new Water Law was approved on 2009. The Water Law required: a national water council, a water authority, a national water resources institute, regional agencies, and basin organizations (GWP, 2011). However, to date there is almost no institutional build up. Although the Water Law is still being implemented, there are some other regulations and laws applied to water conservation and uses, special interest should be taken on the declaration as protected areas of micro watershed that are source of water. This procedure enables the water commissions Juntas Administradora de Agua (JAA) to protect the watershed that contains its water source, either for domestic water or irrigation projects. The process starts with solicitation to the municipal government, which includes a biophysical and socio-economic analysis; then ICF inspects the site; and if it is feasible an agreement is made between the JAA, the municipality, and ICF that authorizes the micro watershed as a protected area with a management plan. The management plan is developed by the JAA and supervised by ICF.

Water pollution is a concern on western Honduras since there are Gold Mines, agricultural and domestic pollution, some of the rivers that discharge at Río Higuito part of the Ulua watershed had heavy metals traces above the standards (Orellana et al., 2008). Coffee production, which is predominant in this area, produces honey water that pollutes water sources. Acceso, Proparque, and Mercado are working on BP to reduce pollution from agricultural aspects including honey water, pesticides and fertilizers, but in general the problem remains, and not all the measures are included.

It has been observed on field visits there is a main concern from farmers on the availability of water and the prevailing perception is that there is a consistent reduction on volumes of water due to climate change and deforestation.

## 2.2.6 ECOSYSTEM SERVICES

Ecosystem services are defined as the benefits people derive from ecosystems. Consistent with international standards this section describes ecosystem service dependencies in western Honduras for future analysis of risks and impacts. Due to its biophysical characteristics, around 85 percent of Honduras’ territory is either forested, or has the potential to be forestry activities. These forested areas provide a number of economic, environmental, social, and cultural benefits for which there are few, imprecise, and generally unavailable values (SS, INE, and ICF International, 2013). For example, Forests are important for catchment and regulation of water sources as well as maintaining water quality. Further, forests maintain soil quality and improve air quality. However, forests are under serious threat of deforestation, especially in rural areas (SERNA, 2008). Deforestation also has a negative impact on Honduras’ footprint. Along with the energy sector, land use and forestry are the primary contributors to Honduras’ increase in carbon emissions.

Consistent with the World Resources Institute (WRI) recommendation for the scoping stage, the table below systematically and comprehensively identifies ecosystem services (WRI, 2011). The supply of ecosystem services depends primarily on the type of ecosystem and its condition. Different ecosystems supply different bundles of services. The geographic extent of an ecosystem and its underlying species composition can also affect the quantity and quality of services the ecosystem supplies and are important measures to gauge its condition.

Table 12 prioritizes ecosystem services that need to be: (1) addressed in further stages of the ESIA because of project impact and (2) addressed in further stages of the ESIA because of project dependence.

TABLE 12. ECOSYSTEM SERVICE IMPACT

ECOSYSTEM SERVICES	ECOSYSTEMS PROVIDING THESE SERVICES	DEPENDENCY ON THE ECOSYSTEM SERVICE IN THE WESTERN DEPARTMENTS (HIGH, MEDIUM, LOW)
<b>PROVISIONING</b>		
Food from crops, livestock, capture fisheries, aquaculture, and wild foods	Agricultural Lands	High. Outside of agriculture limited alternative livelihoods exist
Biological raw materials from timber and other wood products, fibers and resins, animal skins, sand, and ornamental resources	Forests	High. Locally sourced timber is used for construction
Biomass fuel	Forests Agricultural Lands	High. Locally sourced timber is used for cooking, alternatives are too costly for the poorest families
Freshwater	Forests and Small Springs (surface water)	High. Natural springs are the primary source of potable water, irrigation is limited
Genetic resources / biodiversity	Forests	Medium. Large and medium-sized birds and mammals are a source of bush meat and supplement the diets of some families
Biochemicals, natural medicines, and pharmaceuticals	Forests	Low
<b>REGULATING</b>		
Regulation of air quality	Forests, Agroforestry	Medium. Low levels of industrialization limit pollution
Regulation of local, regional, and/or global climate	Forests, Agroforestry	Medium. Forested areas, coffee, and cocoa farms are substantially cooler than maize farms or rangelands
Regulation of water timing and flows	Forests, Agroforestry	High. Forests on steep slopes help slow runoff rates
Erosion control	Forests, Agroforestry	High. Forests on steep slopes help slow runoff rates
Water purification and waste treatment	Forests, Agroforestry	High. Forests help slow water and allow for infiltration and associated purification
Regulation of diseases	Forests, Agroforestry	Low
Regulation of soil quality	Forests	Medium. Forests help retain soils but steep slopes and high runoff limit nutrient accumulation in many areas
Regulation of pests	Forests, Agroforestry	Medium
Pollination	Forests, Agroforestry	Medium
Regulation of natural hazards	Forests, Agroforestry	High. Forests on steep slopes help regulate erosion, landslides, and flash floods
<b>CULTURAL</b>		
Recreation and ecotourism	High elevation forests	Low
Educational and inspirational values	Forests and waterways	Low

ECOSYSTEM SERVICES	ECOSYSTEMS PROVIDING THESE SERVICES	DEPENDENCY ON THE ECOSYSTEM SERVICE IN THE WESTERN DEPARTMENTS (HIGH, MEDIUM, LOW)
<b>SUPPORTING</b>		
Habitat	Forests	Medium. High elevation cloud forests provide habitat for numerous species, but biodiversity in pine dominated forests is considerably lower
Nutrient cycling	Forests	Medium. Steep slopes and high runoff limit nutrient cycling in many areas
Primary production	Forests	Medium
Water cycling	Forests	Medium

## 2.3 INFRASTRUCTURE

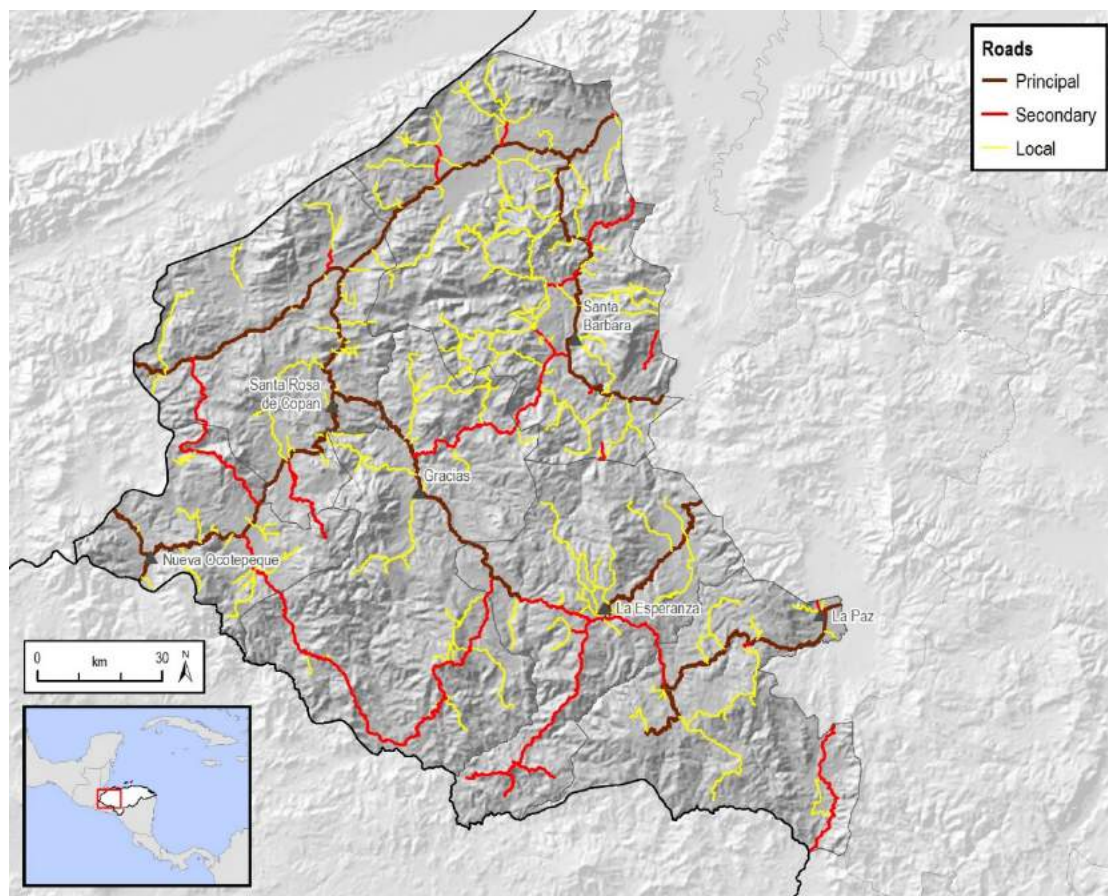
Problems persist with the deterioration of basic infrastructure due to factors such as poor quality of construction materials, lack of maintenance, natural events in the region, or aging buildings.

### 2.3.1 ROADS

The Ministry of Infrastructure, and Public Services (INSEP) is the Ministry responsible for construction and maintenance of the road infrastructure in Honduras. The Ministry currently maintains approximately 2000 km of paved roads, 500 km of concrete roads, 1,000 km of gravel roads and 1,500 km of dirt roads. The primary paved road system connects the 61 cities in Honduras with more than 5000 inhabitants (GoH, 2010). The primary roads in the western part of Honduras are greatly deteriorated, which hinders the development of the productive sector and economic development. The western corridor is important in that it connects the departments of Cortes, Santa Barbara, Copan Lempira and Ocotepeque. This corridor also connects with the borders of El Salvador and Guatemala.

The secondary and tertiary roads receive less maintenance than highways. They are generally deteriorated and many are only passable during the dry season. In the coffee growing areas the Fondo Cafetero maintains the roads so that the coffee crop can get to market. These types of roads are generally constructed with inadequate specifications for tread, ford, and sewage. This results in the production of excessive sediment, which affects waterways and become impassable in the rainy season because of the lack of adequate drainage systems. Water is the primary cause of an accelerated damage to the roads which results in slope erosion and larger sediment loads for rivers and waterways.

FIGURE 10. PRINCIPAL, SECONDARY, AND LOCAL ROADS



Source: ProParque

## 2.3.2 HOUSING

The majority of housing is constructed with adobe and tile, have one or two rooms, with an average of 4–5 people per room and little sanitation. The construction materials of the houses are mostly of mud and adobe with tile roof and zinc and some houses—located mainly in the urban part of municipalities—are built of brick block with asbestos roof.

## 2.3.3 DRINKING WATER (PURIFICATION, TRANSMISSION, AND DISTRIBUTION)

The National Plan states that domestic water supply does not meet demand by 15 percent at the national level, 17 percent at rural and 7 percent at urban areas (GoH, 2010). The Global Water Partnership (GWP) states that the water demand required for domestic use was estimated at 315 million cubic meters for 2011 (GWP, 2011). Investment on the sector are detailed in Table 13.

TABLE 13. INVESTMENT IN DRINKING WATER AND SANITATION IN MILLIONS OF DOLLARS

YEAR	METROPOLITAN DISTRICT	RURAL ZONE	URBAN ZONE	TOTAL
2008	1.5	2.5	4.0	8.0
2009	12	5.1	6.0	23.1
2010	15.0	1.8	4.0	20.8
Total	28.5	9.4	14.0	51.9

Source: GWP, 2011

### 2.3.4 SOLID WASTE MANAGEMENT

Solid waste management practices vary throughout the Western Region. Trash collection is very limited therefore most people burn their trash, although some bury it. This affects the health and quality of life of those in direct contact with uncollected solid waste and informal dumps in streets and ravines. The sites become mosquito-breeding sites, which contain pathogenic contaminants that affect the health of the general population.

The inadequate management of waste is mainly due to a lack of financial and managerial capacity of municipalities to supply the services, and the lack of application of standards and laws to control waste disposal.

### 2.3.5 SEWAGE SANITATION

Water waste/sewage treatment systems have been constructed in most urban parts of municipalities, as well as septic tanks and latrines. However, the majority of rural dwellings manage excrement with latrines, with the help of NGOs, Public Health, and the help of their municipalities.

### 2.3.6 TRANSPORTATION

Access to rural zones is good in some places and regular in others, with bus, truck, and small vehicle accessibility. They are categorized by the Road Network as secondary and local unpaved roads. Most were damaged by Hurricane Mitch in 1998 and some communities are currently cut off as a result of heavy rains and landslides.

## 2.4 CLIMATE, WEATHER, AND TRENDS

Note: Section based on information from USAID's 2014 report: *Vulnerability and Resilience to Climate Change in Western Honduras* (USAID, 2014a).

### 2.4.1 CURRENT CLIMATE AND WEATHER

Across western Honduras, temperature varies spatially primarily as a function of elevation and local land cover, and to a lesser degree, proximity to the coast. Deforestation, in particular, promotes greater heating of the land surface, causing higher daytime temperatures and drier conditions (IPCC, 2013). Climate characteristics common to all areas of western Honduras include:

- marked alternation of wet and dry seasons of approximately equal duration
- wet season bimodality with peaks in June and September
- daily maximum temperatures peaking in April before wet season onset
- significantly cooler conditions during the winter months
- warm and relatively invariant nocturnal temperature throughout the long wet season period

At sub-regional scales, the region's high terrain, prominent landforms, and multiple land surface types create numerous microclimatic variations:

- mountains are moister than valleys
- north-facing windward slopes are more prone to winter-time precipitation
- un-forested valleys tend to have reduced cloud cover and higher daytime temperatures

## 2.4.2 CLIMATE CHANGE

Western Honduras has experienced more than a century of warming that has leveled off, or even declined slightly, since a peak was reached in 1998 with considerable year-to-year variability, mostly as a result of El Niño, La Niña oscillation (ENSO). In the future, temperature in Central America, including western Honduras, is projected to increase by between 1.0 and 2.5 °C by mid-century (IPCC, 2013).

Seasonal rainfall regimes are changing rapidly over most of western Honduras, with a marked trend towards wetter conditions. The most significant changes are extraordinarily large increases registered in the area centered over Ocotepeque. In contrast, rainfall over northern Santa Barbara exhibits a slight negative trend. Data suggest that this variability in precipitation is not due to change in frequency in rainfall, but rather changes in rainfall intensity.

However, according to climate models, this wetter period misrepresents the future of western Honduras. Even under a moderate emissions scenario the net change in precipitation during the April–September period falls in the range of -10 percent to -20 percent by mid-century (2046–2065), which is more severe than reductions shown for eastern Nicaragua and southern Mexico to the East and West. Thus, western Honduras may become a “hotspot” of magnified climate change.

## 2.4.3 VULNERABILITY

Predicted changes in western Honduras will have profound impacts on weather resources. Combined with human pressures, surface water availability, ground water recharge, river flows, water levels, soil moisture are all likely to increase, while irrigation demand, flood event intensity, and water pollution are all likely to increase.

Watersheds that drain into the Atlantic have more productive capability, as do those with higher levels of permanent land cover. The Venado-Lempa and San Juan Lempa watersheds are the most vulnerable to high temperature and low precipitation, while Grande de Otoro is the most resilient.

Natural ecosystems and protected areas are at great risk of damage due to climate change. Areas suitable for cool, moist forest types will decrease, and cloud forests in western Honduras may disappear altogether.

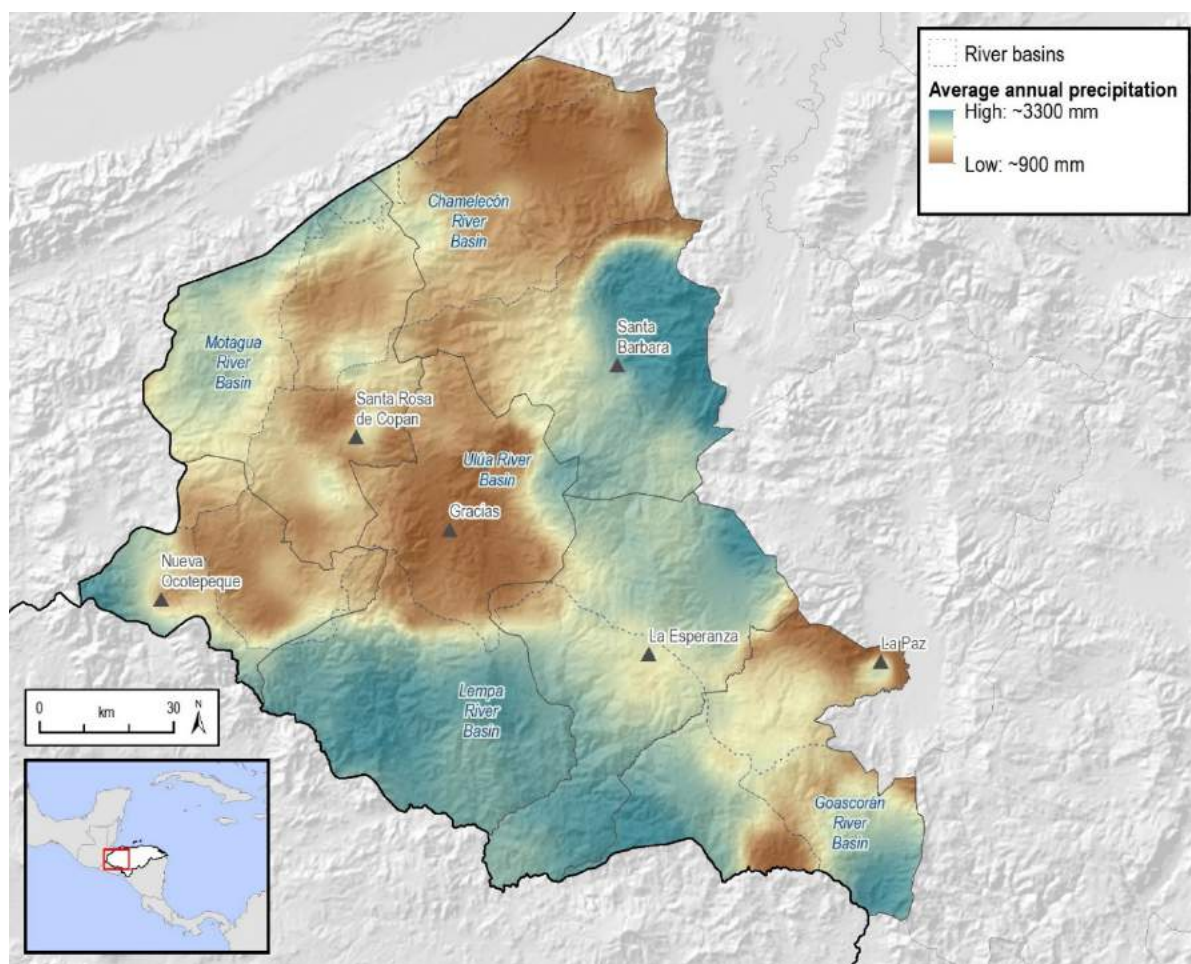
Socioeconomic conditions in western Honduras present high levels of sensitivity to climate exposure, characterized by extreme poverty, malnutrition, lack of good road access, and poor access to consumer markets (USAID, 2014). Climate change will destabilize livelihoods in western Honduras, especially those tied to agriculture and agroforestry.

Coffee, the most economically important crop in the region is also the most susceptible to climate risk, due to its sensitivity to rainfall changes and the increased likelihood of pests and diseases increase with higher temperatures. Horticultural products are also vulnerable and may not be viable for large scale production in the future. Maize, and particularly beans, are the most resilient to the impacts of climate change. Although maize and bean production is critical for food security, it has limited potential to raise income.

## 2.4.4 CORREDOR SECO (DRY CORRIDOR)

The spatial variability of rainfall across western Honduras is organized around the corredor seco (see Figure 11). The broad axis runs locally along the interior of the Central American Isthmus, where annual rainfall is significantly lower than more coastal areas to the north and the south. Further, the canícula, the hottest in driest period of the year, between July and August, is most strongly experienced along the east-west axis of the corredor seco, and much less so to the north and south.

FIGURE 11. AVERAGE ANNUAL PRECIPITATION IN WESTERN HONDURAS



Source: ProParque

Because the corredor seco has a very different environment than the surrounding area, there has been limited research tailored to the region. Development of drought-resistant maize, beans, and coffee would aid in the development of the corredor seco and could help the climate resilience of the entire Western Region.

Further, due to the corredor seco's unique environment, climate change effects on the corredor seco are likely to be more severe than areas to the north and south and will require different adaptation measures.

## 2.5 NON-NATIVE SPECIES IN AGRICULTURE AND AGROFORESTRY

To increase yields from agricultural systems or restore ecosystems to increase the yield of ecosystem services (e.g., timber provisioning, water regulation) non-native species plants or animals may be used (i.e., flora or fauna originating from some other part of the world). While these species are selected for beneficial economic reasons, in some cases, the non-native or cryptogenic species may threaten the diversity or abundance of native species or the stability of existing ecosystems—and therefore impact local economies. These species are invasive and threatening when they are introduced to new environments that lack the physical or biological constraints present in the native environment. Although the majority of introduced species will never become established populations, some will pose a great threat to native ecosystems and economies.

### 2.5.1 INVASIVE SPECIES IN HONDURAS

After habitat destruction, introduction of invasive species represents the second most important global cause of extinction (IUCN, 2010). In Honduras, there are several invasive species that threaten biological diversity in both terrestrial and aquatic ecosystems.

Among the most important plant species are the giant reed (*Arundo donax* L), rubber tree (*Calotropis procer*), African spotted orchid (*Oeceoclades maculate*), water weed (*Egeria densa Planch*), and Malabar plum (*Syzygium jambos*) (Especies Invasoras de Honduras, 2010; Carrasco, 2012).

- The giant reed is on the list of the 100 most damaging invasive species in the world. In the west, giant reed can be found in all eco-systems (Especies Invasoras de Honduras, 2012–2013).
- The African Spotted Orchid has been found in Honduras since 2000, in almost the entire country in humid and dry forests, and from sea level to 1,000 m above sea level (Especies Invasoras de Honduras, 2012–2013).
- The Malabar plum is invasive to all forests between 1,000 and 1,600m above sea level, where it can eliminate all the native flora (Especies Invasoras de Honduras, 2012–2013). In the west it can be found along streams and in ravines.

### 2.5.2 NON-NATIVE SPECIES USE IN AGRICULTURE AND AGROFORESTRY

Producers change agricultural practices with the goal of increasing income security and sometime choose non-native cash crops. For example, African palm has existed in Honduran territory since 1923 as monoculture with a vast extension throughout the national territory, including protected areas and forestry areas. Some strategic entities promote non-native species in agro-forestry systems that are associated with woody trees (e.g., Honduran Quality Coffee), pilot projects with non-native Bush-Buck sweet-potato, etc.

### 3. PURPOSE AND NEED

As established in Section 2 there is **need** for the Proposed Action because poor social and economic conditions are especially pronounced in western Honduras, even though the region is rich in natural resources and biodiversity. The livelihoods of many poor households in this area depend heavily on agriculture but are limited by poor access to technology, markets, electricity, and water resources. These livelihoods are particularly vulnerable to climate change effects such as watershed degradation, variation in precipitation patterns, and degradation of natural resources, including soil degradation and habitat fragmentation.

Consistent with DO2<sup>12</sup>, the **purpose** of the Proposed Action is to sustainably increase incomes—thereby reducing extreme poverty—for vulnerable populations in western Honduras by:

- introducing technologies and improving farmer capacity to increase yields
- improving transportation infrastructure to connect farmers to markets
- bringing electricity to households currently without access
- developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks

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<sup>12</sup> DO2 is “Extreme poverty sustainably reduced for vulnerable populations in western Honduras.” Western Honduras is defined as the six departments: Ocotepeque, Copán, Santa Barbara, Lempira, Intibucá, and La Paz.

## 4. PROPOSED ACTION

This section provides a description of activities currently planned by IPs.

These activities meet DO2 of the Honduras CDCS and the more detailed Purpose and Need statement (see above). The Proposed Action was developed by the Assessment Team through document review, the team's consultations with IPs, and observations on ongoing field activities that will continue to be implemented. Documents reviewed to prepare this section include:

- CDCS 2015–2019
- ProParque Two Year Work Plan
- ProParque Year Three Annual Report (September 2013–September 2014)
- ProParque Quarterly Report No. 13 (October 2014–December 2014)
- ProParque Quarterly Report No. 14 (January 2015–March 2015)
- Mercado Environmental Mitigation Plan (FY2015–FY2020)
- Mercado Year One Work Plan (December 2014–September 2015)<sup>13</sup>
- ACCESO Final Report (April 2011–May 2015)<sup>14</sup>
- PODER Resumen de Cooperación Trilateral

The Proposed Action includes the following major components:

- A. Improve Management of Natural Resources and Biologically Significant Areas
  - Protected areas
  - Forests
  - Water
- B. Increase Adaptive Capacity of Target Communities and Poor Households to Climate Change
- C. Increase Incomes and Reduce Poverty through Targeted Interventions in the Agriculture Sector
  - Enabling environment
  - Production
  - Post-harvest and value added processing
  - Market access
- D. Increase Incomes, Reduce Poverty and Increase Household-Level Resilience through Targeted Interventions in Non-Ag Livelihoods
- E. Improve Service Delivery and Management Systems for Local Public Services
- F. Improve Access to Essential Infrastructure
  - Water
  - Roads
  - Electrification
- G. Integrated Implementation

Consistent with the Development Hypothesis of the CDCS, DO2 will be “implemented with integrated approaches to holistically contribute to poverty reduction. These activities will build and expand on proven strategies that address the root causes of poverty by increasing incomes, supporting renewable energy and environmental conservation, and enabling local and national organizations to provide quality health and education services to families living below the poverty line, the majority of which live in extreme poverty. The

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<sup>13</sup> ACCESO a Mercado 12/6/2014–12/5/2019 US\$23.3 million

<sup>14</sup> USAID-ACCESO 3/18/2011–8/27/2015 US\$40.6 million

target populations for this DO are the poorest households and communities in western Honduras, one of the poorest parts of the country. This population is particularly vulnerable to shocks and repeating the cycle of poverty. To the extent possible, USAID will focus on sub-groups of the extreme poor, women and youth in particular, to avoid further marginalization of these vulnerable groups and to maximize development results. These interventions will be bundled so that targeted communities and families benefit from the synergies of a multi-faceted investment program. Sustainability will be achieved by ensuring that beneficiaries not only rise out of extreme poverty but have incomes that are significantly above the poverty line, enabling families to build the skills and assets to remain out of poverty.”

## 4.1 COMPONENTS OF THE PROPOSED ACTION

### A) IMPROVE MANAGEMENT OF NATURAL RESOURCES AND BIOLOGICALLY SIGNIFICANT AREAS

DESIGNED TO SUSTAINABLY INCREASE INCOMES BY	Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks
ACTIVITIES SUPPORTING CDCS SUB-IR(S)	2.1.1 Natural resource management and biodiversity protection improved

#### PROTECTED AREAS

(A1) Improve **protection and management effectiveness of protected areas** contributing to sustaining and enhancing biodiversity and sustainably supplying ecological services (i.e., water) central to increasing rural incomes. This will be achieved by building an effective co-management model in the PNMC through ProParque’s engagement with local, indigenous inhabitants of the park, and by conducting integral biological monitoring of water resources (quality and flow) of PNMC and PANACAM. In prioritized micro-watersheds selected by the PES team, establish a conservation value monitoring system focused on water resources with UNAH or another institution with experience on water analysis. This will be implemented through a university alliance, which will continue working once the support provided by the project ends.

#### FORESTS

(A2) Develop **forest protection and restoration programs** that take advantage of the high capacity of forest for natural regeneration in areas that have already been harvested or degraded:

- support ICF in registering and certifying private natural reserves
- support the Red Hondureña de Reservas Naturales Privadas (REHNAP) and owners of private reserves in completing their files to initiate the registration and certification process in ICF
- support ICF in reviewing and updating the guidelines to develop management plans in private natural reserves
- identify private natural reserves for registrations and certifications
- prepare a basic diagnostic for visitor centers situation, to attract ecotourism to private and public reserves, and to identify needs and strengths and develop a concept model
- develop a proposal for protected area visitor registration tool
- develop a mechanism for statistic tabulation and analysis of visitors in PA

#### WATER

(A3) Source water protection and management through:

- Identifying and supporting the **legalization of water producing (recharge) zones/watersheds** for drinking water or irrigation as a protected area through technical assistance and capacity building. This is done through a participative process involving municipal governments, community’s

organizations such as: JAA, irrigation associations, *Patronatos*, and ICF. The process requires a physical delimitation of the micro watershed, a biophysical description of the watershed, land registration (cadaster) and land ownership identification, development of a watershed protection and management plan. It requires an agreement between municipalities, communities and ICF and there is a set of rules and a clearly defined step by step process defined by ICF for the declaration.

- Technical assistance and capacity building for **managing land use** in the watershed through territorial zoning and by planning land restoration and improved management with owners and local governments.
- Restoration of water regulation and purification ecosystem services through the protection of critical forested areas and the **reforestation** using native species within source watershed area on both public and private lands when feasible. Seedlings are obtained and sometime produced either from municipal nurseries and/or from ICF tree nurseries. Some of the water sources for community and irrigation supply are located on the buffer and core zones of protected areas.
- Development of **a mechanism for protection** by assisting watershed and water association boards (WABs) in the development of payment for ecosystem service (PES) mechanisms through training/capacity building, support interpreting government of Honduras (GoH) legal requirements. PES systems work to first establish a price signal and non-zero value for protecting the watershed since volumetric payments are typically beyond the immediate capacity of the communities.
- **Mobilization and consensus** building through meetings with local communities, water boards, watershed committees, and municipalities to agree to watershed protection, organize observation committees, and develop tree planting programs. Developing environmental watershed management plans detailing activities, demarcation, delimitation, conservation, protection, establishing of live and dead barriers at the water sources, identifying equipment/personnel needs, and timing and persons responsible.

(A4) Promote water management at the municipal and community levels through **formalization** and **legal recognition** of watersheds, micro-watersheds, and WABs, and **strengthening of WABs**, including:

- Facilitating the development of an **organizational structure and function** for boards and support committees (operation and maintenance, watershed management, sanitation and education) to effectively manage watersheds, while taking into account the general water law and national regulation of water boards.
- Support establishing **administrative systems** for recordkeeping, accounting and financial transparency, subscriber registration, and service contracts to comply with GoH legal requirements (e.g., yearly reporting to Ministries).
- Review and readjustment of **rates and cost structures** paid by members of the water user association with the goal of managing water boards as commercial operations with positive balance sheets. Water tariffs rates vary from \$0.47/month to \$2.40/month per household which, may not cover the full costs of system operation and maintenance, but will establish a price, signaling water scarcity, and source of income for the board.
- Capacity building for efficient and effective **operation and maintenance** of the water system that will keep all of its parts functioning correctly on all its components, starting from the source (water capture), the conduction line, distribution tank, community distribution network to the household/tap or to the irrigated plot. These would be achieved through the training of water managers and plumbers.

(A5) Development of watershed “master plans” at the micro-watershed level to support decision-making on source water protection, infrastructure development, and water management.

## B) INCREASE ADAPTIVE CAPACITY OF TARGET COMMUNITIES AND POOR HOUSEHOLDS TO CLIMATE CHANGE

DESIGNED TO SUSTAINABLY INCREASE INCOMES BY:	Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks
ACTIVITIES SUPPORTING CDCS SUB-IR(S)	2.1.1 Natural resource management and biodiversity protection improved 2.1.2 Adaptation of poor household to climate risks increased

(B1) **Installation of new climatologic stations**, which form part of the national weather service network, with linkages to risk insurance policies.

- Establish early alert systems by coordinating with the Comisión Permanente de Contingencias (COPECO) in the inventory of radio stations as national assets and documentation of the distribution in each municipality.
- Establish/strengthen a system to monitor weather condition by establishing strategic alliances with key partners at national and regional level and conducting needs assessment in watersheds.

(B2) Improve **access to climate change and ecosystem monitoring data** for use in adaptation and mitigation strategies.

- Identify priority sites for ecological integrity monitoring, defining a work plan—a simplified methodology—for monitoring in the priority sites, conducting monitoring, and preparing ecological integrity reports.
- Develop a series of workshops and stakeholder meetings to establish the baseline on ecological integrity in protected areas, biological monitoring of birds, and explore biological monitoring alliances.
- Establishment of research alliances in Honduras to conduct ecological monitoring fieldwork focused on biological, social, environmental, agricultural, touristic, cultural research, strengthening of REHNAP, the Mesa de ONGs Comanejadoras de Areas Protegidas de Honduras (MOCAPH), Proyecto Aldea Global (PAG), and MAPANCE.
- Developing a community or municipality map to identify potential threats using high, medium, and low risk categories. The maps complement prevention and response plans by identifying the most important community resources, such as churches, schools, shelters, escape routes, emergency operations centers, health centers, production areas, water storage tanks, bridges, and human resources.

(B3) Installation of **improved/clean cook stoves** in households to reduce reliance on fuel wood and save women time.

## C) INCREASE INCOMES AND REDUCE POVERTY THROUGH TARGETED INTERVENTIONS IN THE AGRICULTURE SECTOR

DESIGNED TO SUSTAINABLY INCREASE INCOMES BY:	Improving farmer capacity to increase yields Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks
ACTIVITIES SUPPORTING CDCS SUB-IR(S)	2.1.1 Natural resource management and biodiversity protection improved 2.1.2 Adaptation of poor household to climate risks increased 2.2.1 Agricultural productivity improved 2.2.2 Market demand and access increased

### ENABLING ENVIRONMENT

(C1) **Engage research institutions** (e.g., agricultural schools in western Honduras) to carry out **research** that will contribute to farmer households achieving higher yields, introduce more resistant and productive crops, and adopt sustainable production and postharvest practices. **Education** of farmers through demonstration plots at agricultural schools and through curriculum development with graduating students placed in community-based internships (with the IP) to work directly with farmer clients and micro, small, and medium-sized enterprises (MSMEs).

(C2) Facilitate a market for **farm finance** and **crop insurance** products that are within the reach of poor farmers and develop long-term business alliances for stronger farmer groups and link them to brokers.

- Business skills training will be provided directly by the activity business and finance specialists, and augmented by Mercado-trained staff of partner financial service providers, anchor firms, and training organizations located in the Zone of Influence (ZOI). Farmers producing export products markets will be trained in advanced recordkeeping required for full traceability. For farmers with limited literacy, family members will be trained in recordkeeping.

## PRODUCTION

(C3) Provide training in **good agricultural practices (GAPs)** to increase production, productivity and field quality to increase income and market participation including:

- Implement extension activities at the farm and household level that incorporate **GAPs**, including integrated soil fertility, crop, pest management, and water management, water conservation and minimizing of agricultural runoff. Examples include:
  - Contour beds
  - Drainage systems
  - Low tillage techniques
  - Wind/erosion barriers
  - Crop rotation
  - Hybrid and standard variety seeds with resistance to local pest and diseases
  - Safe use and storage of pesticides
  - Best plant density for crop and variety specific
  - Correct harvest and postharvest handling
  - Cost control of crops
- Promote reforestation of fallow areas with coffee or cacao

Provide training and **crop-specific technical assistance** to increase production, productivity and field quality to increase income and market participation. For example, coffee management using **drip irrigation** where appropriate, improved pruning, culling and replanting of infected coffee trees in upper elevations and within buffer zones of protected areas (In most areas of the project, coffee is grown under shade trees and in some areas that have cloud cover the coffee doesn't have shade trees.)

(C4) Introduce and diversify production into high-value horticultural crops suitable for on-farm drying and community-level storage and aggregation, including:

- Chia
- Stevia, turmeric
- Lemongrass
- *Mucuna pruriens* (a tropical legume)

(C5) Sustainably increase the profitability of agroforestry, organic production, value chains and certification of coffee cultivation, with limited **expansion of the production area** to lands already owned by the farmer, but not currently under production (i.e., reclaiming fallow lands). One such example includes ProParque's work to provide coffee growers technical assistance with cooperatives such as Honduras Quality Coffee (HQC) to meet the standards needed for achieving certifications.<sup>15</sup>

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<sup>15</sup> This can be scaled to include other export crops, but there are currently no proposed actions that plan to do so.

(C6) Promotion (but not direct procurement of) of pesticides for all commercial production operations. Pesticides approved by the Pesticide Evaluation Report and use consistent with the Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP).<sup>16</sup>

- **Use of pesticides selected and approved in the PERSUAP against the main pests and diseases of target crops.** Approved pesticides are among the least toxic options, and represent a range of pesticides needed to minimize the risk of resistance.
  - The application method and use of the pesticide, the safety precautions required and the ability of applicators to comply with strict handling and use precautions given the state of regulation and infrastructure available in Honduras are taken into consideration.
  - Potential effects of the proposed pesticide on the environment, including birds, fish, bees, other non-target plants and animals, and residual effects in the soil and surface or ground waters were also considered in selecting the pesticides included in this request.
  - Use in the production, processing, and marketing of around 50 crops. These include a range of vegetables (tomato, peppers, onion, lettuce, potato, broccoli, cauliflower, and oriental vegetables), fruits (watermelon, papaya, strawberry, raspberry, and plantain), tree fruits (avocado, peach), herbs (cilantro, lemon grass), and coffee. A list of the primary pests and diseases of concern for these crops has been developed. These are the pests and diseases considered to be most prevalent and of greatest economic importance for each crop, affecting either the yield or quality of the final product; and depending on threshold levels, may need biological or chemical controls.
  - Management and disposal of packaging and cleaning of equipment used when pesticides are applied, clearly defined cleaning and washing areas with mitigation measures for the wastewater disposal using biological beds.
- **Prioritized use of bio-pesticides** since the majority of pesticides approved in the PERSUAP are bio-pesticides or are considered by USEPA to be reduced risk pesticides or organophosphate alternatives. These new generation, low-risk pesticides, are designed to replace older, more toxic organophosphates and other more toxic compounds. Use of these pesticides is consistent with integrated pest management principles by encouraging farmers to select less toxic alternatives.
- **Pesticide recommendations** for client to purchase and use will primarily be based on cultural controls and integrated crop and pest management systems. Recommendations will be made where necessary for pesticide use for the control of weeds, pests and diseases when economically necessary and commercially viable. Many pesticides are available in Honduras to control a variety of pests and many farmers use these indiscriminately to try to eradicate pest infestations in their fields.
- **Use will be guided by integrated crop management (ICM) protocols** that emphasize Good Agricultural Practices (GAPs) and promote cultural, physical and biological controls over chemical controls. When necessary, based on scouting and pest monitoring data, pesticides may be recommended to control the infestation as part of this ICM strategy. Only pesticides registered for use against the particular pest on the particular crop will be recommended. For example, some cultural practices are being used such as netting for vegetables in early growing stage that minimizes the need for pesticides.

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<sup>16</sup> At the time of the PEA's publication a PERSUAP revision was underway, but not complete.

(C7) Improve productivity through the transfer/installation of **simple production technologies** (including capacity building to use the technologies) appropriate to smallholder production systems and rural geographic zones for planting, harvest, post-harvest management, crop storage and the first stage of processing including:

- drip irrigation systems (using drip tape that is regionally available)
- improved solar dryers to introduce new postharvest technology to the small-scale coffee grower sector to add value on-farm by allowing the grower to sell dried coffee as opposed to wet beans
- seedling nurseries, animal traction, corn seeders, and small-scale processing equipment
- low cost pack houses made of materials readily available on the farm (e.g., bamboo, reusable drip tape)
- charcoal evaporative cooling storage facilities made of materials readily available on the farm (e.g., charcoal, chicken wire, bamboo)
- processing equipment
- grading and packing systems such as basic shaded field structures made from materials readily available on the farm
- drums and clean water for washing
- field crates for harvesting and transport
- grading tables where appropriate; and worker hygiene to ensure quality and reduce potential crop losses.
- ecological ovens and evaporators using sugar cane bagasse (eliminating the need for fuel wood), in a process designed by the University of Vermont for the production of sugarcane panela

**Introduce and promote innovative technologies**, such as providing technical assistance to growers and municipalities on the use of “mountain microorganisms” (microorganismos eficaces de montaña)—including, but not limited to earthworm composting of coffee pulp waste. Earthworm (*Eisenia fetida*) transforms coffee pulp that is a major contaminant of water into a valuable compost. Use of the microorganisms for pulp disposal enables growers to certify their farming systems as environmental-friendly and obtain farm certifications, which in turn allows entry in higher value markets and increased incomes.

(C8) Construction of **on-farm bio-digesters**, which offer a solution to waste management (including waste management for coffee waste, and cattle and pig manure) and reduce dependence on forest resources as well as providing a source of clean, renewable energy and bio-fertilizers for rural families.

## **POST-HARVEST AND VALUE ADDED PROCESSING**

(C9) **Improvement of post-harvest infrastructure** and improve technical knowledge through field schools to produce **milk, dairy products, and meat** that meet quality standards for the local and regional markets.

(C10) Increase export volumes by improving the equipment and the infrastructure of plants **packaging and commercializing exotic fruits** for the international market. Infrastructure improvements include building rehabilitation (e.g., roofing, electrical, plumbing). Equipment purchases include cold room, stainless steel tables, the submersible pump and control panel, water tanks for processing.

(C11) **Improvement of post-harvest infrastructure** and applying good manufacturing practices (GMPs) to produce high quality **products (e.g., cacao) for the international market**. Examples of construction

include fermentation, drying and storage centers; including a receiving tank for the waste water; a storage warehouse; a physical space for an office (and receiving the grain); a drying area with two dryers; electrical installations; guard station and perimeter fence.

## MARKET ACCESS

(C12) Strengthen market linkages between farmers, buyers/sellers (including coyotes), and markets through:

- Identification and **scaling-up of existing small- and medium-scale enterprises** by increasing purchases from and delivery of services to small-scale household farmers, including coffee buyers and mills; intermediate-level buyers with basic grading and packing infrastructure; nascent exporters; small-scale intermediaries who provide market outlets; and logistics, financing, and local input providers seeking to expand their number of customers.
- **Attract larger companies** from outside western Honduras to assist in the establishment of buying, packing, and processing operations close to new small-scale household farmer supply networks. These include locally operated consolidation or grading points in the ZOI to optimize logistics for delivery to supermarkets and collection facilities for larger processors and exporters.

(C13) Improve access to high-value markets through certifications and branding and capacity building to help farmers meet market quality requirements.

- **Certification** (e.g., Rainforest Alliance, UTZ, 4C) and production of high-value coffee and cacao using third-party verified application of good agriculture practices (GAPs).
- **Educating brokers** on market opportunities, market information sources, quality standards and financing.
- Support the development of **designation of origin coffee brands** (e.g., Comayagua, Santa Bárbara).
- **Strengthening coffee cooperatives** through the purchase of quality laboratory equipment, training for train coffee tasters, and certification of export coffee quality by partners.

## D) INCREASE INCOMES, REDUCE POVERTY, AND INCREASE HOUSEHOLD LEVEL RESILIENCE THROUGH TARGETED INTERVENTIONS IN NON-AG LIVELIHOODS

DESIGNED TO SUSTAINABLY INCREASE INCOMES BY:	Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks
ACTIVITIES SUPPORTING CDCS SUB-IR(S)	2.1.1 Natural resource management and biodiversity protection improved 2.2.2 Market demand and access increased

(D1) **Strengthen value chains that facilitates biodiversity conservation** (agroforestry promotion, coffee planting with shade trees, and small-scale tourism linked to protected areas), yielding higher incomes for households and micro, small, and medium enterprises.

- analyze best practices and certification practices that contribute to climate change adaptation and should be implemented to improve agroforestry value chains
- identify main gender gaps in the forestry and coffee value chain by analyzing baseline information disaggregated by sex
- develop baseline for economic development for new value chains and by geographic areas
- design a national strategy to promote bird watching tourism, including identifying educational route for training tour guides and planning training courses

## (D2) Ecotourism Promotion

- capacity building for hotel owners (e.g., Sistema Integrado Centroamericano de Calidad y Sostenibilidad (SICCS) regulation certification)
- develop capacities in restaurants to adopt good operational practices (e.g., SICCS regulation certification)
- train local and national tourism guides
- assistance to local chambers and operators in development of tourism products linked to parks
- development of Western Coffee Trail as a regional tourism product
- promotion and advancement of bird watching as a key national tourism sector
- promotion of regional cultural tourism events and products
- development of western Honduran cuisine as tourism attraction
- consolidation of capacity of local chambers, local governments and private sector to plan and execute cultural and regional tourism events
- institutional strengthening of local tourism chambers in the west

(D3) Analyze role and impact of small crafts and artisan in local economy.

## E) IMPROVE SERVICE DELIVERY AND MANAGEMENT SYSTEMS FOR LOCAL PUBLIC SERVICES

DESIGNED TO SUSTAINABLY INCREASE INCOMES BY:	Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks
ACTIVITIES SUPPORTING CDCS SUB-IR(S)	2.2.2 Market demand and access increased 2.3.2 Local service management systems improved

(E1) Working with municipalities to develop **forest fire prevention and control plans**, that include training of water boards and community leaders as forestry fireman, and involve the mancomunidades, Unidad Municipal Ambiental (UMAs), Comité de Emergencia Local (CODELs), watershed committees, ICF, COPECO and other projects.

(E2) Provide technical support to assist municipalities to invest their budgets strategically and design and implement a **financial strategy** to cover operational costs for Mesa de ONGs Comanejadoras de Areas Protegidas de Honduras (MOCAPH) and co-management agencies.

(E3) Promote projects that improve community resiliency through providing diversified employment/income opportunities for the poor in newly developed or expanded **off-farm (synergistic) microenterprise services** that quickly and visibly either expand production or market opportunities, or improve health and nutrition, including:

- microprocessors (targeting women)
- input stores
- seedling producers (targeting women and youth)
- land preparation services
- farm machinery repair services (targeting youth)

- spraying services
- harvesting teams (targeting women)
- threshing services
- crate rental services
- transporters
- solar drying services (coffee/maize)
- veterinary services (including artificial insemination)
- forage chopping services (for dairy)
- pump rental
- washing/postharvest services (targeting women)
- pollination services
- drip tape recyclers
- eco-stove manufacturers
- latrine manufacturers
- plumbers
- home repairs (floor, wall improvements)

(E4) Promote sanitary homes and improve community and household sanitation by:

- Expanding **basic household improvements** including covering floors and walls to facilitate cleaning, remove dust and dirt, and prevent pests; extending water supply from the garden to the kitchen to improve human and food hygiene; increasing use of filters for drinking water; constructing small gates to prevent the animals' entry into houses; **installing Eco-Justa stoves**, and recommending transparent roof sheeting to allow light inside the house to facilitate cleaning and food preparation.
- Installing latrines and wash tanks for households receiving health and nutrition support, enabling more efficient household water use and improved sanitary conditions. Providing training in the use and maintenance of the latrines and tanks.

(E5) Improved waste management by providing technical support (including trainings and coordination between communities and government) on **classification and marketing of wastes** such as first-in-first-out and aluminum; treatment of organic waste with microorganisms; identification of sites for relocation of municipal dumps; landfill management; preparation of proposals for integrated waste management; and training on local waste management and **establishment of sanitary landfills**.

## F) IMPROVE ACCESS TO ESSENTIAL INFRASTRUCTURE

DESIGNED TO SUSTAINABLY INCREASE INCOMES BY:	Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks Improving transportation infrastructure to connect farmers to markets Bringing electricity to households without electricity
ACTIVITIES SUPPORTING CDCS SUB-IR(S)	2.1.1 Natural resource management and biodiversity protection improved 2.1.2 Adaptation of poor household to climate risks increased 2.2.1 Agricultural productivity improved 2.2.2 Market demand and access increased

### WATER

(F1) Enable access to water management technologies that increase agricultural production and resilience by:

- Constructing **small-scale intakes at micro watershed catchments, usually made with concrete, with few or non-mechanical equipment**, including analysis of flows, source water protection, and capacity building on appropriate operation and management. Catchment systems are designed to meet the "maximum critical need" of the selected crops for a pre-determined area (ha) and a pre-determined number of farms. Maximum withdrawals are calculated at the driest time of the year and designed into the installed infrastructure at the source, but without systematic measurement or abstraction restrictions.
- Constructing **gravity-fed irrigation water distribution/conveyance** systems with PVC pipe to bring water from the catchment to farms (typically less than 10 farms) including **automatic filters** to assure water quality standards when drip irrigation tape is used.
- Installation of **farm-level irrigation systems**, usually drip irrigation tape, gravity fed, and designed for use for fertigation.
- Installation if needed of (non-electric) **hydraulic ram pumps** or **renewable energy-based pumps** for use in farms for productive activities and in communities for potable water supply.
- Building **small-scale water harvesting systems** intended to capture runoff, divert it through pipes and store it on the farms ponds and/or on local catchments that meet topography, soils and other design criteria.

(F2) Improve access to potable water by:

- **Constructing new or improving existing potable water systems** through construction or improvement for water capture; improvements in pipeline; rehabilitation of storage tanks; installation of chlorination and filtration systems; rehabilitation of load break structures; expansion of domestic distribution networks; installing micro-measurement systems
- Pumping systems using and providing renewable energy at sites when necessary and applicable
- Improving water treatment through the installation of water filtration and chlorination systems for communities with severe water quality problems. These activities will be planned based on the results of water quality testing.

### ROADS

(F3) To link producers to markets, kids to school, and families to health centers investments will be made through the **maintenance and refurbishing of existing secondary roads (defined as two-lane roads)**

**and tertiary roads (defined as one lane roads with an average between 4-5 meters wide).** No new roads will be directly constructed. Examples of road activities include:

- land elevation, leveling and grading (including quarries and borrow pits for source materials)
- installing, repairing, or rehabilitating drainage culverts
- slope stabilization
- waste management
- harnessing runoff to protect the roads and surrounding environment and in some cases channeling for use in irrigation or groundwater recharge
- building retaining walls for erosion control depending on slope stability and other local conditions

Selection of roads based on feasibility study and anticipated benefits/selection criteria, including:

- connecting farmers/communities benefiting from USAID agricultural assistance to markets
- facilitating market linkages by encouraging farmer groupings focused around market opportunities and business services that require scale
- ability to avert or minimize flooding of roads and the weakening of bridge foundations

## **ELECTRIFICATION**

(F4) Promote small-scale renewable energy projects in extremely poor off-grid communities (i.e., more than 5km from that last grid connection) to provide rural electrification and minimize greenhouse gas emissions. In all cases technology selection and production potential to be determined at each site based on demand and site specific conditions. Electricity generation projects will include:

- micro- and small-scale hydro projects
- installation of photovoltaic systems
- small-scale wind and biogas

Targeted use of solar technologies, including:

- sale of small solar lamps (~1Kw) with cell phone chargers
- installation of solar irrigation pumps

## **G) INTEGRATED IMPLEMENTATION**

(G1) USAID intends to implement these discrete activities with an integrated approach that focuses on (1) several of the activities being implemented by the same IPs, and (2) coordination between IPs to ensure that activities holistically contribute to poverty reduction.

The six components are interrelated and integrated in order to achieve the DO2 objective. **Component A** (Improve Management of Natural Resources and Biologically Significant Areas) **and Component C** (Increase Adaptive Capacity and Resilience of Target Communities and Poor Households to Climate Change) are the **two pillars** which link substantially to the other components and help ensure that income gains/poverty reduction is sustainable in the long-run.

Components E (Improve Service Delivery and Management Systems for Local Public Services) and F (Improve Access to Essential Infrastructure) in turn support and sustain components C (Increase Incomes and Reduce Poverty through Targeted Interventions in the Agriculture Sector) and D (Increase Incomes, Reduce Poverty and Increase Household level Resilience through Targeted Interventions in Non-Ag Livelihoods).

It is noted that the Component A, which is carried out mostly by ProParque will end in June 2016. Absent the formation of another activity, this will leave a gap in that one of the pillar areas.

Examples of specific relationships between the components are:

- A. Activities to improve management of natural resources and biologically significant areas will be implemented with activities focused on (c) the agriculture sector and (f) improving access to water and energy infrastructure.
- B. The installation of improved/clean cook stoves will be implemented along with (c) increase incomes and reduce poverty through targeted interventions in the agriculture sector. Climate information will be integrated with (a) improved management of natural resources and biologically significant areas.
- C. The implementation of activities to increase incomes and reduce poverty through targeted interventions in the agriculture sector will be implemented with activities to (a) improve management of natural resources and biologically significant areas, particularly water resources, and (f) improve access to essential infrastructure, particularly water and roads infrastructure.
- D. The implementation of activities to increase incomes, reduce poverty and increase household level resilience through targeted interventions in non-ag livelihoods will be implemented with activities to (a) improve management of natural resources and biologically significant areas.
- E. The implementation of activities to improve service delivery and management systems for local public services is implemented with activities to (a) improve management of natural resources and biologically significant areas, particularly as it relates to water infrastructure, and (c) increase incomes and reduce poverty through targeted interventions in the agriculture sector, particularly activities associated with post-harvest and value added processing, and market access.
- F. Activities improving access to water infrastructure is implemented with activities to (a) improve management of natural resources and biologically significant areas and (b) increase incomes and reduce poverty through targeted interventions in the agriculture sector through production. Improving access to transportation infrastructure works to (c) increase incomes and reduce poverty through targeted interventions in the agriculture sector through increasing access to markets. Increasing rural electrification work so (b) increase adaptive capacity and resilience of target communities and poor households to climate change.

## 4.2 MITIGATION MEASURES ASSOCIATED WITH THE PROPOSED ACTION

For the purposes of analysis, the Proposed Action is defined to include mitigation measures—so that the impacts assessment does not include impacts that were foreseen and mitigated. Because the components of the Proposed Action are planned or ongoing projects with mitigation measures established in Environmental Mitigation and Monitoring Plans (EMMPs) or PERSUAPs under Reg. 216, those mitigation measures are **included in the analysis of alternatives and environmental consequences section as general best practices for siting and design**. The EMMPs follow USAID best practices for Latin America and the Caribbean Bureau and include sections on the objectives and strategy for the project, anticipated activities and a discussion on environmental impact, evaluation of environmental impact, specific mitigating actions, and example tables for the Implementing Partner to complete in the field.

*NOTE: Over 100 mitigation measures are associated with the various elements of the Proposed Action. For clarity in the analysis these mitigation measures are not listed, but instead called out as examples as appropriate in Section 7.*

TABLE 14. ACTIVE OVERALL/OVERARCHING EMMPS AND EMPRS IN THE AFFECTED AREA

IEE NO.	IEE EXPIRATION DATE	DETERMIN.	USAID PROJECT	OVERALL EMMP OR EMPR NAME OF ACTIVITY AND LOCATION	APPROVAL DATE
FY 2015					
None approved as of January 2016					
FY 2015					
LAC-IEE-14-13	30 September 2016	CE, NDwC	USAID-Mercado	Overall EMMP	14 May 2015
			Cooperacion Trilateral	Umbrella EMMP	2 February 2015
FY 2014					
LAC-IEE-14-13	30 September 2016	CE, NDwC	USAID-ACCESO	EMMP Sombrilla para pequeños sistemas de riego	28 July 2014
LAC-IEE-14-13	30 September 2016	CE, NDwC	USAID-ProParque	Guía de buenas prácticas ambientales para pequeños proyectos de energía renovable	20 December 2013
LAC-IEE-14-13	30 September 2016	CE, NDwC	USAID-ACCESO	Overall EMMP	18 December 2013
LAC-IEE-14-13	30 September 2016	CE, NDwC	USAID-ACCESO	EMMP Sombrilla para instalación de sistemas de riego	9 October 2013
FY 2013					
N/A					
FY 2012					
LAC-IEE-14-13	30 September 2016	CE, NDwC	USAID-ProParque	Overall EMMP	2 March 2012

Source: USAID/Honduras EMPR Tracker, updated 10 November 2015

## 5. ISSUES ANALYZED OR ELIMINATED FROM FURTHER REVIEW

The following section includes a comprehensive list of concerns, developed during the scoping phase, that the Assessment Team identified in its review of documents, field work and stakeholder consultations. Section 5.1 describes the issues that were evaluated in this PEA (Table 15). Section 5.2 lists the issues that were eliminated from further study in the PEA, and gives a justification for elimination (Table 16). As stated in Reg. 216, a concern can be eliminated from detailed study in the PEA if the issue is not significant or has been covered by earlier environmental review or approved design considerations.

### 5.1 IDENTIFICATION OF POTENTIALLY SIGNIFICANT ISSUES

Consistent with 22 CFR 216.3(a)(4)(a) this section describes the issues that were analyzed in this PEA. The issues were determined to be “potentially significant” and therefore worthy of in-depth investigation and analysis in the PEA based on considerations of their likely or reasonably foreseeable scope, direct effects, indirect effects, and cumulative effects on the environment as a result of the Proposed Action.

Factors weighed in the Assessment Team’s determination of potential significance included the likelihood of:

- induced direct or indirect changes in the pattern of land use, population density or growth rate, or related effects on air and water and other natural systems, including ecosystems<sup>17</sup>
- permanence and reversibility of induced changes
- potential cumulative effects
- nonconformance with USAID or Honduran national environmental requirements

Table 15 lists the **13 potentially significant issues that were used in the PEA as the framework for the Effects/ Environmental Consequences discussion** (22 CFR 216.6(c)(5)) in Section 7, which included the environmental impacts of the alternatives; any adverse effects that cannot be avoided; irreversible or irretrievable commitments of resources; direct and indirect effects and their significance; cumulative effects; possible unintended consequences; possible conflicts between the Proposed Action and land use plans, policies, and controls for the areas; energy requirements; and conservation potential.

For each issue the table also includes information on the associated Proposed Action(s) (i.e., whether the action could cause the issue, or the action is at risk of being affected by the issue) as well as a categorization of whether the issue has potential direct, indirect, or cumulative effects. Direct effects occur at the same time and place as the Proposed Action. Indirect effects are results of the action that are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative effects refer to “impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonable foreseeable future actions.”<sup>18</sup> These effects result from the interaction of multiple activities over time or geographic areas, and may last for many years beyond the life of the project. Typically, the cumulative effects assessment of a proposed project considers the overall effects of “associated facilities” on those same environmental and human resources and systems in the project area of influence.

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<sup>17</sup> See definition under <https://ceq.doe.gov/nepa/regs/ceq/1508.htm#1508.7>

<sup>18</sup> See [http://www.usda.gov/rus/water/ees/pdf/AECI\\_FEIS/Sect\\_4.pdf](http://www.usda.gov/rus/water/ees/pdf/AECI_FEIS/Sect_4.pdf) or the definition of cumulative effects offered by the Council on Environmental Quality. This definition is used in the National Environmental Policy Act, and is the reference document for USAID EIA regulations.

TABLE 15. POTENTIALLY SIGNIFICANT ISSUES EVALUATED IN THE PEA

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE
1	Use of restricted use pesticides (RUPs) for local market crops (hortilizas) due to widespread availability of low cost RUPs and increased purchasing power as incomes grow.	C6 Promotion of PERSUAP-approved pesticides and ICM
2	Misapplication, failure to use personal protective equipment, poor storage, and inappropriate final disposal of pesticides (including PERSUAP approved pesticides) due to low perceived risk of pesticides or lack of funds.	C6 Promotion of PERSUAP-approved pesticides and ICM
3	Return to traditional practices or shift away from GAPs if markets are not robust and the implementation of GAPs (e.g., integrated pest management, soil conservation) is not enforced by the market.	C3 Good ag practices C7 Ag technology
4	Loss of forests and biodiversity from agricultural expansion (including deforestation within protected areas) as a result of high demand/prices and availability of land (fallow or new)	C5 Production area expansion (limited to fallow land)
5	Over-reliance on chemical fertilizers when on-farm bio-matter is used for energy (e.g., manure for bio-digesters) instead of soil enrichment.	C8 Bio-digesters
6	Risk of market rejection (i.e., limited market or permanent closure) if products and processed foods do not comply with sanitary standards due to lack of technical capacity and risk management measures.	C12 Strengthen market linkages C13 Improve access to high-value markets through certifications
7	Insufficient climate change adaptation measures due to lack of information sharing and design for future conditions: projects are not designed based on climate change information. Climate vulnerability information has not been used to help to make decisions for adaptation to climate change (e.g., Irrigation projects not storing water for drought periods). Further, information from the meteorological network is not readily accessible to farmers and the general public.	F1 Water management technology for irrigation F3 Roads F2 Potable water systems F1.5 Water harvesting reservoirs C4 Diversify crops C3 Good ag practices C7 Ag technology
8	Risk of source water protection failure (quality and quantity) if delineated source water protection areas cover too little of the watershed. Upstream development (e.g., land clearing) and economic activities (e.g., agriculture) could increase pollution/sedimentation or use water in a manner that jeopardizes the water source. Risks are exacerbated by the lack of soil conservation measures in traditional farming practices.	A3 Source water protection A5 Watershed master plans F1 Water management technology for irrigation F1.5 Water harvesting reservoirs F2 Potable water systems
9	Diminished downstream water availability and water quality from over-extraction for domestic and agricultural water use and wastewater discharges: water extractions during severe droughts may also exceed minimum biological flows. Point- and nonpoint source water pollution From agricultural and domestic wastewater and sanitary landfills could	E4 Household improvements E5 Waste management and landfills F1 Water management technology

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE
	decrease water availability for downstream users.	for irrigation F2 Potable water systems
10	Risk of water systems failure due to lack of financial resources and technical capacity for maintenance and replacement: when some infrastructure components are technically complex and expensive (e.g., automated filters) and water boards do not collect adequate revenue to cover the costs of operating and maintaining the system, the resulting partial system failure could lead to failure of the entire system.	A4 Water boards F1 Water management technology for irrigation F2 Potable water systems
11	Weak coordination between USAID projects, and between implementing partners and the government of Honduras (at local and national levels), due to independent project design and implementation.	A3 Source water protection A5 Watershed master plans C5 Production area expansion (fallow land) F1 Water management technology for irrigation F1.5 Water harvesting F2 Potable water systems F3 Roads G1 Integration
12	Increased social disparity as a result of limited participation in USAID projects within communities: the socio-economic disparity between project beneficiaries and non-beneficiaries, if present conditions prevail, could cause community conflicts, exacerbating risk of migration and land clearing (rent seeking).	F1 Water management technology for irrigation C12 Strengthen market linkages C13 Improve access to high-value markets through certifications
13	Threat to protected areas: increased tourism could result in exceeding the carrying capacity, in terms of number of visitors, for each protected area.	D1 Value chains that facilitate biodiversity conservation D2 Ecotourism promotion

## 5.2 ISSUES ELIMINATED FROM FURTHER REVIEW (ISSUES THAT ARE NOT POTENTIALLY SIGNIFICANT)

During the scoping phase, the Assessment Team identified the following issues, which are not potentially significant and were therefore eliminated from consideration in the PEA (Table 16).

**TABLE 16. ISSUES DEEMED INSIGNIFICANT DURING SCOPING AND JUSTIFICATION FOR ELIMINATING**

ISSUE	RAISED BY	JUSTIFICATION FOR ELIMINATING
Threat from invasive species, risks associated with the use of new exotic species (e.g., California earth worms), their effect on the ecosystem balance and other flora and fauna if the species becomes invasive, and required mitigation measures.	USAID	No invasive species are being used in agriculture production in the field. USAID projects should already conform to USAID biosafety procedures for the introduction of new species and follow ICF rules related to the use of non-native species.
Design of hydroelectric and solar projects and potential scale-up of bio-gas, without mitigating direct and indirect environmental effects through an Environmental Impact Assessment process.	Assessment Team	Project will comply with GoH environment regulations and review. Each future project will undergo an Environmental Impact Assessment. PODER has implemented a partnership with GoH and will work within the GoH development framework and priorities.
Mis-selection/maladaptation of trees in agroforestry (e.g., mango trees in cacao field) resulting in low yield or tree death.	Assessment Team	In several cases sub-optimal trees are selected for shade in coffee and cacao plantations. While this selection of species may be sub-optimal from an agroforestry and economic efficiency standpoint it is usually done out of personal preference by the farmer and generally leads to greater on-farm biodiversity. Continued on-farm technical assistance to farmers regarding agroforestry tree species selection should minimize this issue.
Genetically modified organisms (GMOs) and transgenic seeds threatening biodiversity or traditional social systems.	Assessment Team	GMOs are not readily sold in the program area and there is no widespread concern or resistance to GMO crops or products.

Table 17 documents which issues were eliminated from further analysis either because the issue was determined not to be significant based on the additional information gathered in the post-scoping analysis phase.

**TABLE 17. ISSUES DEEMED INSIGNIFICANT FOLLOWING ADDITIONAL ANALYSIS OR DATA COLLECTION AND JUSTIFICATION FOR ELIMINATING**

ISSUE	RAISED BY	RATIONALE FOR ELIMINATIONS
Threats to biodiversity in/near forested and protected areas as a result of electrification: new energy and electrification projects encourage rural development, which if not planned properly could increase pressure on	Assessment team following consultation with PODER	This issue was eliminated in the analysis phase because the scale of all PODER project is small or very small (less than 3–4 kw) and all are working within the ESIA framework for Honduras—therefore projects are individually analyzed for impacts and adverse impacts are mitigated on that

ISSUE	RAISED BY	RATIONALE FOR ELIMINATIONS
forests and protected areas. Birds are especially at risk of collision with poorly sited transmission lines and wind turbines.		basis. The beneficiaries are individual families or community buildings (e.g., health centers)
Encroachment on protected areas, loss of biodiversity, and risk of deforestation from improved roads: improved roads will increase traffic and reduce transaction costs for illegal logging, housing development, and increased agricultural development, contributing to the loss of biodiversity and deforestation.	Assessment team following consultation with Chemonics	These issues were eliminated in the analysis phase because the contract was modified to reduce the scope of roads projects to pre-feasibility studies designed to inform the future selection process for actual road improvements.
Risk of soil erosion and disturbances to surface waters and damage to habitats from refurbished roads: if the roads are not adequately designed and do not include all the mitigation measures, as well as good maintenance programs, the roads could cause soil erosion, downstream sedimentation, water pollution, and eventually habitat damage.		

## 6. ALTERNATIVES

### 6.1 DEFINITION OF ALTERNATIVES AND INDICATORS

This section defines the No Action Alternative and the Alternative designed by the Assessment Team—in consultation with USAID and IPs—following the identification of issues during scoping.

#### 6.1.1 NO ACTION ALTERNATIVE

The No Action Alternative is defined as a continuation of the status quo environmental and development scenario in western Honduras absent any and all USAID intervention. Past ACCESO and ProParque activities would not receive technical assistance services. Best practices promoted in the past may continue through each farmer's own initiative, but the sustainability of those efforts is questionable without follow up extension services given the short amount of time that the program has been in operation.

The management of natural resources and biologically significant areas would continue to receive limited prioritization by the government of Honduras. Protected areas would be used without having specified carrying capacity and would not be well demarcated. Forested areas and water resources protected by those areas would receive limited management and restoration programs would be limited. Source water protection would be limited and informed water balances for watersheds and sub-watersheds would not exist. Landfills would be uncontrolled. The ecotourism infrastructure and programs (i.e., bird watching) implemented by ProParque would not continue with USAID support nor receive maintenance assistance from USAID.

With regard to infrastructure, additional investments to improve access to essential water infrastructure and electricity connections would be low. Planning for road rehabilitation and improvement would proceed at a slower pace due to limited funding by the government of Honduras.

While climate change adaptation is a priority for the government of Honduras, climate information would continue to be limited because of the lack of additional climatologic stations to strengthen the national weather service network. Few households would have access to improved/clean cook stoves in households and many would continue to rely on fuel wood.

There would be no additional interventions in the agriculture sector to increase incomes and reduce poverty beyond what the completed ACCESO pat activity had implemented. Specifically, absent USAID continuing interventions, no additional farmers would receive education on risks associated with restricted use pesticides (RUPs), and there would be limited education on personal protective equipment (PPE). Due to a lack of on-farm technical assistance there would be limited implementation of soil conservation measures beyond what the past ACCESO activity had implemented with past farmers. No new farmers would receive training in GAPs and crop-specific technical assistance (e.g., drip irrigation). On the farm there would be no additional use of bio-digesters, limited use of compost, and current trends of declining soil quality and unplanned agricultural expansion would persist. A lack of investment in farm technology would continue to limit financial capacity and on-farm improvements. Without initiatives to connect farmers and markets, subsistence farming would most likely persist within the Project Area.

With the No Action Alternative, there would be no additional capacity building to improve service delivery and management systems for local public services including forest fire prevention, and no additional support for municipal budgeting and financial management. Furthermore, efforts to develop or expand off-farm (synergistic) microenterprise services would be limited without targeted interventions in non-agriculture livelihoods (such as ecotourism promotion or enhanced support for local artisans) to increase incomes, reduce poverty, and increase household-level resilience.

## 6.1.2 THE ALTERNATIVE

This section describes the Alternative defined by the Assessment Team to address each of the issues identified during scoping (see corresponding numbers in the tables below). For each issue, the Alternative **could replace or substitute the Proposed Action**. The Alternative includes the following components:

- Component A provides an alternative to the components of the Proposed Action that deal with PERSUAP-approved **pesticides**, pesticide safety, and RUPs.
- Component B provides an alternative to the components of the Proposed Action that deal with **agro-ecosystems**.
- Component C provides an alternative to the components of the Proposed Action that deal with **water resource** development and management.
- Component D provides an alternative to the components of the Proposed Action that deal with **development near and within protected areas**.

For the purposes of environmental effects analysis in Section 7, a metric for comparison is established for each issue. When data were available a quantitative metric was proposed. However, due to the overwhelming lack of detailed baseline environmental information and monitoring, in the majority of cases a qualitative metric was proposed. Note that the “Metric for Use Effects Analysis” carries forward to the tables in Section 7.

### COMPONENT A—PESTICIDES

This component of the Alternative, by emphasizing safe and proper use of PERSUAP-approved pesticides in support of larger yields, supports sustainable increase of incomes—thereby reducing extreme poverty—for vulnerable populations in western Honduras and meets the Purpose statement by:

- introducing technologies and improving farmer capacity to increase yields
- developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks

TABLE 18. COMPONENT A—PESTICIDES

NO.	ISSUE	PROPOSED ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY AND JUSTIFICATION FOR METRIC	METRIC FOR USE IN EFFECTS ANALYSIS
1	Use of RUPs for local market crops (hortilizas) due to widespread availability of low cost RUPs and increased purchasing power as incomes grow.	C6 Promotion of PERSUAP-approved pesticides and ICM.	<p>Work with agricultural stores in or near beneficiary communities to reduce the supply of RUPs and assure the availability of PERSUAP-approved agrochemicals (i.e., focus on reducing supply in addition to existing efforts to reduce demand). Also, improve public awareness through training and placement of posters/visuals.</p> <p>Work with distributors (e.g., Due West) to assure the availability of PERSUAP-approved pesticides.</p> <p>Start with a pilot project.</p> <p>Collaborate with Ministry of Agriculture to review and decrease the number of GOH-approved RUPs and illegitimate pesticides.</p>	Preferred metrics would be the extent of RUP use on a representative sample of farms or the volume of RUPs sold in a representative sample of agriculture stores. A separate study would be needed to collect this data, which was beyond the scope of this assessment. This indicator was not included in the mid-term or final evaluations for ACCESO and therefore data were not available.	Net positive increase in the use of RUPs, net negative use of RUPs, or no change in the use of RUPs.
2	Misapplication and failure to use PPE (including PERSUAP-approved pesticides) due to low perceived risk of pesticides or lack of funds.	C6 Promotion of PERSUAP-approved pesticides and ICM.	Work with agricultural stores to develop promotions for PPE, such as single use ponchos, with the purchase of select PERSUAP-approved pesticides).	<p>Preferred metrics would be the percentage of farmers correctly using PPE based on random sample survey of farmers in the area of influence. A separate study would be needed to collect this data.</p> <p>This indicator was not included in the mid-term or final evaluations for ACCESO.</p>	Net positive increase in the use of RUPs, net negative use of RUPs, or no change in the use of RUPs.

## COMPONENT B—AGRICULTURE

This alternative sustainably increases incomes—thereby reducing extreme poverty—for vulnerable populations in western Honduras and meets the following parts of the Purpose statement by:

- introducing technologies and improving farmer capacity to increase yields
- developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks

TABLE 19. COMPONENT B—AGRICULTURE

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
3	Return to traditional practices and/or shift away from GAPs (e.g., integrated pest management, soil conservation) if markets are not robust and the implementation of GAPs is not enforced by the market.	C3 Good ag practices C7 Ag technology.	Use an implementation method in which a cooperative, NGO, or buyer provides core technical assistance helping producers meet minimum market standards. For example, develop strategic alliances with fair trade-oriented exporters or domestic buyers (supermarkets and markets), so that those entities support USAID's technical assistance in production, harvesting and post-harvest, safety, financing, distribution, and marketing.	Data available on the number of communities with market link (cooperative or direct contact with buyers) only reflects ProParque information and experience.	Number of producers connected to exporters or buyers and who receive assistance from these exporters or buyers.
4	Loss of forests and biodiversity from agricultural expansion (including deforestation and physical expansion of participating farms within protected areas) as a result of high demand/prices and availability of land (fallow or new)	C5 Production area expansion (limited to fallow land anywhere, including buffer zones )	Promote projects (preferably agroforestry) consistent with the Plan de Manejo in buffer zones and areas adjacent to protected areas. This will ensure irrigation and potable water projects are designed to minimize impact on the protected area, and improve awareness and empower buffer zone communities to maintain the integrity of protected areas. Find farmers in the nucleus and	Data are available on the area (ha) of forest loss (maps, satellite) through public-access satellite images from Google maps. Data are also available through historical maps elaborated upon by community members through participatory methodology. National land use maps with forest cover and agricultural cover can serve as a reference for analysis. NOTE: Forested area in hectares and percent forested area data are available at the department level and reported in Scoping	Deforested hectares Land use changes (based on public access satellite images).

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
			retitle lands outside protected areas to them by strengthening “Programa de Titulación de Tierras en Áreas Protegidas.” Involve and coordinate with state institutions (e.g., Instituto Hondureño del Cafe, ICF) conducting research on coffee agroforestry. Conversion of fallow land in agroforestry systems with a strong market relationship instead of developing in protected area buffer zones.	Statement.	
5	Over-reliance on chemical fertilizers when on-farm bio-matter is used for energy (e.g., manure for biodigesters) instead of soil enrichment.	C8 Bio-digesters.	Develop on-farm and household or community composting and mulching projects. Give trainings on establishing compost and establish model compost piles in each community. The compost would be used as fertilizer and would reduce the cost to the farmer of purchasing synthetic fertilizers.	Data are not yet fully available on: Number of biodigesters still in use after 5 years Number of compost sites Number of producers that manage organic waste through compost. Number of producers that have reduced the use of synthetic fertilizers. Expenditures on fertilizers based on a register of each producer’s production income and expenditures (partial availability from ACCESO beneficiaries).	Relative use of composting compared to purchased fertilizers.
6	Risk of market rejection (i.e., limited market or permanent closure) if products and processed foods (e.g., panela and encurtidos) do not comply with sanitary standards due to lack of technical capacity and risk management measures.	C12 Strengthen market linkages C13 Improve access to high-value markets through certifications.	Work with SENASA and Health Ministry to provide training for food safety measures and to establish market certification and sanitary regulations and improve product quality. Certify coffee producers to be recognized by the ICF to maximize benefits of agroforestry for farmers.	Number of sanitary registrations with the government of Honduras were not available for the analysis.	Number of sanitary registrations.

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
7	Insufficient climate change adaptation measures due to lack of information sharing and failure to design for future conditions. Project designs do not incorporate climate change information. Climate vulnerability information not used to help to make decisions for adaptation to climate change. Inaccessibility of meteorological network to farmers and the general public.	Planning and design process for: F1 Water management technology for irrigation F3 Roads F2 Potable water systems F1.5 Water harvesting reservoirs C4 Diversify crops C3 Good ag practices C7 Ag technology.	(1) Establish an information system for western Honduras that compiles data from all the meteorological and hydrological stations as well as water quality and quantity monitoring stations. The system should be maintained by a local university or research center to ensure that it will be available regardless of USAID activity. Information will be shared broadly among IPs, farmers, and governments to ensure that information is used in decision-making. Access to data will support adjustments to water use and management plans for irrigation and potable water systems.  (2) Conduct project and technology level risk screening that uses climate change information (e.g., vulnerability studies) and information on the expected useful life of infrastructure to assure that crops are properly selected and interventions increase on-farm and community resilience, and minimize the risk of project failure. (Note: ProParque piloted this for coffee).	Data are available on: Number of climate change risk screening plans/strategies/methodologies for projects or programs (currently only ProParque utilizes a risk screening). Number of weather stations in the project area of intervention. The report from ProParque includes some information regarding ownership and operational status, but it does not include weather stations from ACCESO, Mercado, and Chemonics areas.	Use of climate information in a risk screening process.

## COMPONENT C—WATER RESOURCES AND WATERSHED MANAGEMENT

This component of the Alternative sustainably increases incomes—thereby reducing extreme poverty—for vulnerable populations in western Honduras and meets the following parts of the Purpose statement by:

- Introducing technologies and improving farmer capacity to increase yields
- Developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks

TABLE 20. COMPONENT C—WATER RESOURCES AND WATERSHED MANAGEMENT

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
8	Risk of source water protection failure (quality and quantity) if delineated source water protection areas cover too little of the watershed. Upstream development (e.g., land clearing) and economic activities (e.g., agriculture) could increase pollution/ sedimentation or use water in a manner that jeopardizes the water source. Risks are exacerbated by the lack of soil conservation measures in traditional farming practices.	A3 Source water protection A5 Watershed master plans F1 Water management technology for irrigation F1.5 Water harvesting reservoirs F2 Potable water systems.	Aggressive programs to declare upper watersheds as source water protection areas. Expand source water protection areas, develop best practices for implementing ICF declaratory procedures and training water boards, local NGOs, and municipal water districts on the protected zone declaration process. Identify bottlenecks of the declaration process and promote and lobby direct actions through ICF that reduce or eliminate bottlenecks. At least three sub-basins within each targeted sub-watershed will be fully declared and demarcated following ICF procedures, with trained water boards and water district staff.	Data on number of water boards are available, but there are no data on their record of enforcement or protection actions. Data on boundaries of PAs and number of support trainings are available. Information on the number of protected watersheds declared to be complying with ICF regulation (Declaratoria De Zona De Protección Forestal) is not currently available.	Upper watershed protection capacity by Water Boards and Water Districts. <ul style="list-style-type: none"> <li>• None (there is no capacity at all)</li> <li>• Some (there is some, insufficient capacity)</li> <li>• Adequate (the boards were capable of independently completing tasks)</li> </ul>
9	Diminished downstream water availability and water quality from over-	E4 Household improvements. E5 Waste management and	In addition to the proposed actions, (1) Measure water extraction and use, and(2) Design and implement pilot	Preferred data would include: Inventory of current and potential water sources. Water quality and quantity data at source	<ul style="list-style-type: none"> <li>• Improved water quality and quantity</li> <li>• No change</li> </ul>

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
	<p>extraction. Water extractions during severe droughts may result in lower levels than required for minimum biological flows. Point- and nonpoint source water pollution from agricultural waste, domestic waste, and sanitary landfills could decrease water availability for downstream users.</p>	<p>landfills F1 Water management technology for irrigation F2 Potable water systems.</p>	<p>water storage system for multiple purposes (agriculture and potable water) and ensuring equitable access for downstream users. The pilots should be designed for retention and storage for human use and, to the extent possible, for groundwater recharge and flood control. The systems should use gravity for water transport, and solar energy if pumping or disinfection is required. The scale of the projects should be in accordance with technical data derived from an impact assessment process. The infrastructure investment should be complimented by capacity building for users and local governments on water management. Include sanitary practices in water systems, such as latrines (including dry compost) or sewage systems and waste treatment plants, as well as health education.</p> <p>Designate landfill areas and design to avoid water source pollution.</p>	<p>sites, gathered at least quarterly. Intakes and outflows for different users at the selected watersheds. Data could be used for GIS modeling for water quantity and quality at selected watersheds.</p> <p>Currently the data is not available, poorly organized, or it is not shared between USAID projects.</p>	<ul style="list-style-type: none"> <li>Decreased water quality and quantity</li> </ul>
10	Risk of water systems failure due to lack of financial resources, financial capacity, and	A4 Water boards F1 Water management technology for	Financial plans specifying water system revenue requirements and rate adjustment plans to cover specified needs. When	No data are available on water system failures.	Financial system for institutional sustainability of

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
	technical capacity for maintenance and replacement.	irrigation F2 Potable water systems.	installing irrigation systems, farmers and/or cooperatives need to set aside funds to cover the depreciation costs of (1) the distribution system, (2) filters, (3) intakes and maintenance. Rates should also cover operating and maintenance costs. This will require training and enforcement to ensure that costs are calculated appropriately and the rationale for these costs is understood.		irrigation and potable water systems (no system, some efforts, systems working).
II	Weak coordination between USAID projects, and between implementing partners and the government of Honduras	A3 Source water protection. A5 Watershed master plans. C5 Production area expansion (fallow land). F1 Water management technology for irrigation. F1.5 Water harvesting. F2 Potable water systems. F3 Roads. G1 Integration.	Establishment of and participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos de Cuencas to discuss and resolve issues associated with economic development, the development of water resources, and forest use. The composition of the Consejos is specified by the Water Law and includes municipal governments, farmers' groups, and other stakeholders making land development and water development decisions, and therefore, can help ensure that USAID projects are consistent with other local development plans and actions, and do not	N/A – Consejos de Cuencas need to be formed.	Number of Consejos de Cuencas formed or supported.

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
			exacerbate existing social disparities and problems.		
12	Increased social disparity as a result of limited participation in USAID projects within communities: the socio-economic disparity between project beneficiaries and non-beneficiaries, if present conditions prevail, could cause community conflicts, exacerbating risk of migration and land clearing (rent seeking).	F1 Water management technology for irrigation. C12 Strengthen market linkages. C13 Improve access to high-value markets through certifications.	Establishment of and participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos de Cuencas to discuss and resolve issues associated with economic development, the development of water resources, and forest use. The composition of the Consejos is specified by the Water Law and includes municipal governments, farmers' groups, and other stakeholders making land development and water development decisions, and therefore, can help ensure that USAID projects are consistent with other local development plans and actions, and do not exacerbate existing social disparities and problems.	N/A – Consejos de Cuencas need to be formed.	Number of Consejos de Cuencas formed or supported.

## COMPONENT D—DEVELOPMENT NEAR AND IN PROTECTED AREAS

This component of the Alternative sustainably increases incomes—thereby reducing extreme poverty—for vulnerable populations in western Honduras. It meets the following parts of the Purpose statement by developing and sustainably managing water resources and conserving protected areas to strengthen resilience of livelihoods to climatic and economic shocks.

TABLE 21. COMPONENT D—DEVELOPMENT NEAR AND IN PROTECTED AREAS

NO.	ISSUE	ACTION(S) ASSOCIATED WITH THE ISSUE	ALTERNATIVE	NOTES ON DATA QUALITY AND AVAILABILITY	METRIC FOR USE IN ALTERNATIVES COMPARISON
13	Unsustainable tourism or community use of protected areas. Increased tourism could result in exceeding the carrying capacity for visitors.	D1 Value chains that facilitate biodiversity conservation.  D2 Ecotourism promotion.	Conduct a carrying capacity study for each protected area in the Corredor Seco to determine the daily maximum number of tourists to be permitted access. Prepare a public use plan for each protected area to ensure land use is compatible with protected area status. To promote awareness, mark boundaries of protected areas with concrete or other suitable markers.	Data are available on number of public use plans and number of demarcated protected areas, but no carrying capacity studies have been done.	Number of protected areas in Corredor Seco with public use plans and implementing carrying capacity plans Number of demarcated protected areas.

## 6.2 ALTERNATIVES COMPARISON (SIMILARITIES AND DIFFERENCES)

Consistent with 22 CFR 216.6(c)(3), this section summarizes, for each issue determined to have a potentially significant impact on the environment as a result of the Proposed Action, the differences in how that issue is addressed by the No Action Alternative, Proposed Action associated with that issue, and the Alternative presented in Section 6.1. This highlights key differences between the components of the Proposed Action and the Alternative and will help the reader understand the reasonable anticipated environmental effects presented in the next section. As stated previously, **the Alternative is in addition to the Proposed Action (i.e., enhancement).**

TABLE 22. ALTERNATIVES COMPARISON

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
PESTICIDES				
N/A	Elements of Proposed Action with no issues	None of the actions specified in the Proposed Action and Alternatives column (right)	<p><i>The Proposed Action and Alternative have all of these individual components in common:</i></p> <p>(A1) Improve protection and management of protected areas.</p> <p>(A2) Develop forest protection and restoration programs that take advantage of the high capacity of forest for natural regeneration, in areas that have already been harvested or degraded.</p> <p>(B1) Install new climatologic stations that will form part of the national weather service network, with linkages to risk insurance policies.</p> <p>(B2) Improve access to climate change and ecosystem monitoring data for use in adaptation and mitigation strategies.</p> <p>(B3) Install improved/clean cook stoves in households to reduce reliance on fuel wood.</p> <p>(C1) Engage research institutions, carry out research and education of farmers.</p> <p>(C2) Facilitate a market for farm finance and crop insurance products that are within the reach of poor farmers and develop long-term business alliances for stronger farmer groups and link them to brokers.</p> <p>(C3) Provide training in GAPs, provide crop-specific technical assistance (e.g., drip irrigation).</p> <p>(C9) Improve post-harvest infrastructure and improve</p>	

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
			<p>technical knowledge through field schools to produce milk, dairy products, and meat that meet quality standards for the local and regional markets.</p> <p>(C10) Improve the equipment and the infrastructure of plants packaging and commercializing exotic fruits for the international market.</p> <p>(C11) Improve post-harvest infrastructure and apply good manufacturing practices (GMPs) to produce high quality cacao for the international market.</p> <p>(C12) Identify and scale up existing small- and medium-scale enterprises and attract larger companies.</p> <p>(C13) Improve access to high-value markets through certifications, branding, and capacity building to help farmers meet market quality requirements.</p> <p>(D1) Strengthen value chains that facilitate biodiversity conservation.</p> <p>(D2) Promote ecotourism.</p> <p>(D3) Analyze role and impact of small crafts and artisans in local economy.</p> <p>(E1) Develop forest fire prevention and control plans.</p> <p>(E2) Provide technical support to help municipalities invest their budgets strategically, and design and implement a financial strategy to cover operational costs for MOCAPH and co-management agencies.</p> <p>(E3) Develop or expand off-farm (synergistic) microenterprise services that quickly and visibly either expand production and market opportunities, or improve health and nutrition.</p>	

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
1	Use of RUPs for local market crops (hortilizas) due to widespread availability of low-cost RUPs and increased purchasing power as incomes grow.	No education or action on risks associated with RUPs.	C6 Pesticide promotion—farmer education on and promotion of PERSUAP-approved pesticides and ICM to reduce demand for RUPs.	Work with agriculture stores and the Ministry of Agriculture to reduce the supply of RUPs and assure the availability of PERSUAP-approved agrochemicals.
2	Misapplication and failure to use PPE (including PERSUAP-approved pesticides) due to low perceived risk of pesticides or lack of funds.	No education on PPE.	C6 Promotion of PERSUAP—approved pesticides and ICM—working directly with farmers to educate.	Work with agriculture stores to develop promotions for PPE with the purchase of pesticides (e.g., discount on PPE—specifically single use ponchos—or free PPE with the purchase of select pesticides).
AGRICULTURE				
3	Return to traditional methods and/or shift away from GAPs if markets are not robust and the implementation of GAPs (e.g., integrated pest management, soil conservation) is not enforced by the market.	No soil conservation.	C3 Good ag practices C7 Ag technology Both promoted directly by USAID IP.	C3 Good ag practices C7 Ag technology Both promoted directly by the cooperative, NGO, or buyer working with the USAID IP.
4	Loss of forests and biodiversity from agricultural expansion (including deforestation within protected areas) as a result of high demand/prices and availability of land (fallow or new).	No limiting of unplanned agricultural expansion.	C5 Production area expansion (limited to fallow land)—Expansion planned for areas selected by IPs based on previous work (includes reclaiming fallow lands; no deforestation).	Select and promote projects consistent with the Plan de Manejo in the buffer zones and immediately outside nearby protected areas (includes reclaiming fallow lands; no deforestation).

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
5	Overreliance on chemical fertilizers when on-farm bio-matter is used for energy (e.g., manure for bio-digesters) instead of soil enrichment.	No use of bio-digesters and limited use of compost.	C8 Bio-digesters.	Composting instead of bio-digesters.
6	Risk of market rejection (i.e., limited market or permanent closure) if products and processed foods do not comply with sanitary standards due to lack of technical capacity and risk management measures.	Subsistence farming with no access to markets.	C12 Strengthen market linkages C13 Improve access to high-value markets through certifications.	Work with CENASA and Health Ministry on training for food safety measures, to establish market certification and sanitary regulations, and improve product quality.
7	Insufficient climate change adaptation measures due to lack of information sharing and failure to design for future conditions. Project designs do not incorporate climate change information. Climate vulnerability information has not been used to help make decisions for adaptation to climate change (e.g., irrigation projects are not storing water for drought periods). Further, information from the meteorological network is not readily accessible to farmers and the general public.	No climate change adaptation.	Planning and design for: F1 Water management technology for irrigation F3 Roads F2 Potable water systems F1.5 Water harvesting reservoirs C4 Diversify crops C3 Good ag practices C7 Ag technology Implemented <i>without</i> climate information or risk screening to guide technology selection and integrate programs.	Same as Proposed Action, except: Implemented <i>with</i> climate information and risk screening to guide technology selection and integrate programs.
WATER				
8	Risk of source water protection failure (quality and	No additional protection of	A3 Source water protection A5 Watershed master plans	Up-front planning to assure water quality and quantity at the source

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
	quantity) if delineated source water protection areas cover too little of the watershed. Upstream development (e.g., land clearing) and economic activities (e.g., agriculture) could increase pollution/ sedimentation or use water in a manner that jeopardizes the water source. Risks are exacerbated by the lack of soil conservation measures in traditional farming practices.	source water.	F1 Water management technology for irrigation F1.5 Water harvesting reservoirs F2 Potable water systems.	for irrigation and potable water projects for all projects within one targeted watershed in each department. The target watershed will be fully declared and demarcated following ICF procedures, with trained water boards and water district staff.
9	Diminished downstream water availability and water quality from over-extraction for domestic and agricultural water use and wastewater discharges. Water extractions during severe droughts may also exceed minimum biological flows. Point- and nonpoint source water pollution from agricultural waste, domestic waste, and sanitary landfills could decrease water availability for downstream users.	No water management for irrigation; no water treatment or distribution Unrestricted landfill siting.	E4 Household improvements E5 Waste management and landfills F1 Water management technology for irrigation F2 Potable water systems  Leading to potential conflicts downstream for water pollution and availability of water.	In addition to the proposed actions, (1) Measure water extraction and use, and (2) Design and implement pilot water storage system for multiple purposes (agriculture and potable water) and ensuring equitable access for downstream users. The pilots should be designed for retention and storage for human use and, to the extent possible, for groundwater recharge and flood control. The systems should use gravity for water transport, and solar energy if pumping or disinfection is required. The scale of the projects should be in accordance with technical data derived from an impact assessment process. The infrastructure investment should be

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
				<p>complimented by capacity building for users and local governments on water management. Include sanitary practices in water systems, such as latrines (dry compost) or sewage systems and waste treatment plants, as well as health education.</p> <p>Designate landfill areas and design to avoid water source pollution.</p>
10	Risk of water systems failure due to lack of financial resources and technical capacity for maintenance and replacement. When some infrastructure components are technically complex and expensive (e.g., automated filters) and water boards do not collect adequate revenue to cover the costs of operating and maintaining the system, the resulting partial system failure could lead to failure of the entire system.	No investment in farm technology and drinking water. No water management program.	A4 Water boards F1 Water management technology for irrigation F2 Potable water systems.	Financial plans specifying water system revenue requirements and rate adjustment plans to cover specified needs. When installing irrigation systems, farmers and/or cooperatives need to set aside funds to cover the depreciation costs of (1) the distribution system, (2) filters, (3) intakes and maintenance. Rates should also cover operating and maintenance costs. This will require training and enforcement to ensure that costs are calculated appropriately and the rationale for these costs is understood.
11	Weak coordination between USAID projects, and between IPs and the government of Honduras (at local and national levels), due to independent project design	No coordination	A3 Source water protection A5 Watershed master plans C5 Production area expansion (fallow land) F1 Water management technology for irrigation F1.5 Water harvesting F2 Potable water systems	In addition to the proposed actions, establishment of and participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the

NO.	ISSUE AREA	NO ACTION	PROPOSED ACTION	ALTERNATIVE (IN ADDITION TO THE PROPOSED ACTION)
	and implementation.		F3 Roads G1 Integration.	Consejos to discuss issues associated with economic development, the development of water resources, and forest use.
12	Increased social disparity as a result of limited participation in USAID projects within communities: the socio-economic disparity between project beneficiaries and non-beneficiaries, if present conditions prevail, could cause community conflicts, exacerbating risk of migration and land clearing (rent seeking).	No on-farm improvements or connections of farmers to markets.	F1 Water management technology for irrigation C12) Strengthen market linkages C13) Improve access to high-value markets through certifications.	In addition to the proposed actions, establishment of and participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos to discuss issues associated with economic development, the development of water resources, and forest use.
PROTECTED AREAS				
13	Unsustainable tourism or community use of protected areas. Increased tourism could result in exceeding the carrying capacity for visitors.	Use of protected areas without regard to carrying capacity.	D1 Value chains that facilitate biodiversity conservation D2 Ecotourism promotion.	Conduct a carrying capacity study for each protected area in the Corredor Seco to determine the maximum daily number of tourists to be permitted access to ensure the sustainable use of the natural resources. Prepare a public use plan for each protected area to ensure land use is compatible with protected area status. To promote awareness, mark boundaries of protected areas with concrete or other suitable markers.

## 7. EFFECTS / ENVIRONMENTAL CONSEQUENCES

This section of the PEA describes the reasonable anticipated environmental effects of No Action, the Proposed Action, and the Alternative. The environmental consequences analysis required by 22 CFR 216.6(c)(3) is conducted using metrics for comparison as specified in Section 6.

Because many elements of the Alternative **could take place in watersheds separate from the current Proposed Action sites** the Alternative is analyzed on a stand-alone basis. The cumulative effects comparison of the Proposed Action and the Alternative (defined to include the Proposed Action) is summarized in Section 7.5 and discusses the macro-level cumulative effects.

This section is based on, and builds on, the information presented in Section 2 on Affected Environment. As such, the direct- and indirect-environmental consequences and cumulative effects analyses correlate to the Affected Environment section as follows.

*NOTE: As stated in Section 4.2 (Mitigation Measures), **the Proposed Action is defined to include mitigation measures**—so that the impacts assessment does not include impacts that were foreseen and where there are already measures in place for mitigation. As such, impacts are described and show how the mitigation measures associated with the actions would minimize the impacts or improve the effectiveness of the actions.*

### 7.1 PESTICIDES

TABLE 23. ANTICIPATED ENVIRONMENTAL EFFECTS RELATED TO PESTICIDES OF THE PROPOSED ACTION AND ALTERNATIVES

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
1 Use of Restricted use Pesticides (RUPs)  & 2 Failure to use PPE, poor storage, and inappropriate final disposal of pesticides	Net positive increase in the use of RUPs, net decrease in use of RUPs, or no change in the use of RUPs.	No education or action on risks associated with RUPs No education on PPE.	C6 Promotion of PERSUAP-approved pesticides and ICM.	Work with retailers/distributors, and the GOH, to reduce supply of RUPs, and assure availability of PERSUAP-approved pesticides, and provide incentives for PPE.
		<b>Expected change in metric:</b> No change in the use of RUPs, continued RUP use.	<b>Expected change in metric:</b> Net decrease in use of RUPs.	<b>Expected change in metric:</b> Net decrease in use of RUPs.
		<b>Direct effect:</b> No change in the use of RUPs. They will still be available and widely used and result in acute public health problems (via	<b>Direct effect:</b> Net decreased use in RUPs because farmers will have received trainings on the risk (decreasing demand).	<b>Direct effect:</b> Net decreased use in RUPs because ag stores will carry fewer RUPs, carry more approved pesticides, and provide information on

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
		<p>misapplication and contaminated clothing) and environmental contamination.</p> <p><b>Indirect effect:</b> Adverse downstream human health and environmental effects would continue without change.</p> <p><b>Cumulative effect:</b> Without programs to reduce RUP use, increase PERSUAP-approved use where necessary, and implement ICM, RUP use will continue and likely grow. Region-wide adverse human health and environmental effects would continue without change.</p>	<p><b>Indirect effect:</b> Net decrease in downstream human health and environmental effects.</p> <p><b>Cumulative effect:</b> Over time, as farmers switch from RUPs to PERSUAP-approved pesticides, and as they implement ICM, there will be a net decrease in region-wide adverse human health and environmental effects. The rate of pesticide use should decline, the toxicity of the pesticides used will decline, and application, storage, and disposal in accordance with PERSUAPs should increase.</p>	<p>the risk of RUPs (lower supply and demand). Decrease should occur faster than under proposed action because program starts higher in the supply chain, workings with suppliers rather than consumers.</p> <p><b>Indirect:</b> Net decrease in downstream human health and environmental effects.</p> <p><b>Cumulative effect:</b> Over time, if retailers and distributors agree to carry fewer RUPs and more PERSUAP-approved pesticides, and as they provide more information about the risk of RUPs, RUP use will decrease more than it would through proposed action C6. If sales outlets provide discounted PPE with purchase of PERSUAP-approved pesticides, use of PPE will increase. Overall, there will be a greater net decrease in region-wide adverse human health and environmental effects.</p>

## 7.2 AGRICULTURE

TABLE 24. ANTICIPATED ENVIRONMENTAL EFFECTS RELATED TO AGRICULTURE OF THE PROPOSED ACTION AND ALTERNATIVES

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
3 Return to traditional methods and/or shift away from GAPs.	Net number of producers linked to exporters and buyers and who receive technical assistance from exporters and buyers.	No soil conservation.	C3 Good ag practices C7 Ag technology.	Cooperative, NGO, or buyer provides core technical assistance helping producers meet minimum market standards.
		<b>Expected change in metric:</b> No net change in numbers of producers.	<b>Expected change in metric:</b> No net change in numbers of producers.	<b>Expected change in metric:</b> Net increase in numbers of producers.
		<p><b>Direct effect:</b> Continue with conventional cultivation practices resulting in environmental degradation and non-compliance with norms or standards of the market. In areas where USAID interventions were conducted in the past, farmers may continue to employ best practices.</p> <p><b>Indirect effect:</b> Return to migrant agricultural work, price fluctuation, inadequate agricultural practices, etc.</p> <p><b>Cumulative effect:</b> Unstable market due to inadequate product quality and variable yields.</p>	<p><b>Direct effect:</b> Although C3 and C7 establish GAPs, and farmers should continue to implement them once they see effects on production, program capacity is limited. Implementation of GAPs may decrease once the project is complete without a market for the product (agro-exporters for example)). Although project expands market access, there is little focus on international markets.</p> <p><b>Indirect effect:</b> Producers don't know the quality standards for each certification at the export stage, inhibiting motivation for certification.</p> <p><b>Cumulative effect:</b> Difficulty in breaking out from local into international markets. Change in market will be gradual and will depend on how long the proposed</p>	<p><b>Direct effect:</b> Development of a close relationship between producers, certifiers, and exporters. Increased production and better quality products continue after the project compared to the PA due to the assistance resulting from these relationships. Higher family incomes due to prices obtained by meeting compliance, demands, and strength of the market compared to the PA. Assistance from market staff and certifiers would continue indefinitely.</p> <p><b>Indirect effect:</b> Closer relationship between producers and certifiers results in better knowledge of standards, increasing producer motivation to achieve certification.</p> <p><b>Cumulative effect:</b> Improved export market; stable prices in the market. Once cooperatives and buyers have been trained to provide technical assistance, they will be able to reach more producers than PA could.</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
			action continues.	
4 Loss of forests and biodiversity from agricultural expansion.	Deforested hectares Land use changes (based on public access satellite images).	No limiting of unplanned agricultural expansion.	C5 Production area expansion (limited to fallow lands).	Promote projects consistent with the Plan de Manejo in buffer zones and areas adjacent to protected areas. Find farmers in the nucleus of a protected area and retitle lands outside protected areas to them.
		<b>Expected change in metric:</b> Increase in deforested hectares.	<b>Expected change in metric:</b> No increase in deforestation.	<b>Expected change in metric:</b> No increase in deforestation.
		<p><b>Direct effect:</b> Advance of the agricultural border. Degradation of forests due to clearing and fragmentation. Biodiversity loss, soil erosion, and sedimentation.</p> <p><b>Indirect effect:</b> Land conflict due to decreased availability of productive land, and incursion into indigenous areas.</p> <p><b>Cumulative effect:</b> Biodiversity loss (threat and risk of extinction) On a large scale due to the combination of past, present, and future land clearing and fragmentation, which degrade or eliminate habitat.</p>	<p><b>Direct effect:</b> Decrease in forest fragmentation compared to the No Action due to emphasis on use of already-cleared land. Through use of satellite imagery, greater precision in determining nucleus areas of protected areas and the change in vegetation leading to habitat loss that may affect local biodiversity. Higher family incomes resulting from focus on returning fallow land to production, as well as focus on agroforestry and certification programs.</p> <p><b>Indirect effect:</b> Conflict between program beneficiaries and non-beneficiaries.</p> <p><b>Cumulative effect:</b> Limited expansion of agriculture in protected areas. Limited loss of biodiversity.</p>	<p><b>Direct effect:</b> Project activities are chosen in accordance with management plans for the protected area resulting in fewer deforested hectares and land change than the Proposed Action in cores of protected areas. More holistic approach to water use, etc., assures proper use of buffer areas. Relocation of producers in accordance with the management plan for protected areas would result in less pressure on forests and allow regeneration of forest in protected areas, as well as preservation of large areas needed to preserve biodiversity.</p> <p><b>Indirect effect:</b> Closer coordination between local governments, grassroots organizations, and the project because the grassroots organizations and project implementers must coordinate with government to assure compliance with the plan.</p> <p><b>Cumulative effect:</b> Sustainability for a wide range of productive systems in the project</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
				area due to holistic approach to managing agricultural expansion. Preservation of biodiversity due to protection of large areas.
5 Overreliance on chemical fertilizers when on-farm bio-matter is used for energy.	Relative use of composting compared to purchased fertilizers	No use of bio-digesters and limited use of compost.	C8 Bio-digesters.	Develop on-farm and household or community composting projects.
		<b>Expected change in metric:</b> Little use of composting	<b>Expected change in metric:</b> Some composting of digested waste	<b>Expected change in metric:</b> High percentage of bio-matter waste composted
		<p><b>Direct effect:</b> Minimal composting used. Producers continue using synthetic fertilizers leading to medium and long term decrease in soil productivity from salinization, loss of microorganisms, and decrease in production. Poor waste management, leading to runoff contaminating water bodies.</p> <p><b>Indirect effect:</b> Increase in production costs from the purchase of synthetic fertilizers.</p> <p><b>Cumulative effect:</b> Families continue to experience food insecurity due to expense of fertilizer and long term decrease in soil productivity. Soils are subject to degradation.</p>	<p><b>Direct effect:</b> Small decrease in the use of synthetic fertilizers and more use of composting than No Action as a result of GAP being promoted and implemented (i.e., incorporation of crop residue in soils). Reduction in pollution as a result of better organic waste management. Access to energy from methane produced by bio-digester.</p> <p><b>Indirect effect:</b> Relative reduction in production costs due to reduced use of synthetic fertilizers. Reduction in greenhouse gases because of methane capture.</p> <p><b>Cumulative effect:</b> Risk of food insecurity persists because synthetic fertilizer use continues to a lesser degree, degrading soil and reducing productivity over the long term. Cost of fertilizer also contributes to food insecurity. Soils begin to recover. A consistent</p>	<p><b>Direct effect:</b> Increased use of composting compared to the PA due to managed organic waste, resulting in healthier soils and increased or consistent long term production. Producers properly manage organic waste, keeping it from contaminating water bodies, and converting it into compost. No energy production.</p> <p><b>Indirect effect:</b> Lower production costs due to the reduced use of synthetic fertilizers. Increase in methane released compared to Proposed Action but same as No Action.</p> <p><b>Cumulative effect:</b> Low risk of food insecurity. Soils recover fertility and have lower risk of degradation. No energy production.</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
			free or low-cost source of energy is available.	
6 Risk of market rejection if products and processed foods do not comply with sanitary standards.	Number of sanitary registrations	Subsistence farming with no access to markets	C12 Strengthen market linkages C13 Improve access to high-value markets through certifications	Work with SENASA and Health Ministry to provide training for food safety measures and to establish market certification and sanitary regulations and improve product quality
		<b>Expected change in metric:</b> No change in number of sanitary registrations	<b>Expected change in metric:</b> Increase in number of sanitary registrations	<b>Expected change in metric:</b> Larger increase in sanitary registrations
		<p><b>Direct effect:</b> Continuing production without attention to sanitary practices. Lack of understanding of how to manage a product. Inability to export products due to lack of compliance with international sanitary standards and lack of connection to buyers, exporters, and other market players.</p> <p><b>Indirect effect:</b> High possibility of disease in consumers due to poor waste management in the production process.</p> <p><b>Cumulative effect:</b> Market loss due to inability to meet sanitary standards set by other countries and domestic standards followed by large processors.</p>	<p><b>Direct effect:</b> Product recruitment and improvement of production methods (improved ovens, less pressure on forests). More products being marketed resulting in increased income due to meeting certifications.</p> <p><b>Indirect:</b> Lower likelihood of disease and reduced contamination of products due to better implementation of sanitation and waste disposal in the production process.</p> <p><b>Cumulative effect:</b> Lower risk of market loss due to improved ability to meet sanitary standards.</p>	<p><b>Direct effect:</b> Producers certified for good agricultural practices and production (SENASA and Health Ministry) resulting in improved ability to meet sanitation requirements. Training targeted specifically to sanitation improves producer knowledge of requirements; training programs have greater reach than PA.</p> <p><b>Indirect effect:</b> Higher family incomes. Lower risk of labor accidents. Infrequent occurrence of disease, due to expert provision of sanitation training to more producers.</p> <p><b>Cumulative effect:</b> Producers sell in stable markets at local, national, and regional levels due to compliance with sanitation standards.</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
7 Insufficient climate change adaptation measures and failure to design for future conditions.	Use of climate information in a risk screening process.	No climate change adaptation.	Planning and design for: F1 Water management technology for irrigation F3 Roads F2 Potable water systems F1.5 Water harvesting reservoirs C4 Diversify crops C3 Good ag practices C7 Ag technology.	Make data collected by IPs accessible to the public by working with a university to share meteorological, and soil moisture data. Use data in water use plans, training programs, and project and technology screening.
		<b>Expected change in metric:</b> No use of climate information in a risk screening process	<b>Expected change in metric:</b> No use of climate information in a risk screening process	<b>Expected change in metric:</b> Use of climate information in a risk screening process
		<p><b>Direct effect:</b> Implementing partners continue making decisions for projects without taking into account climate change and without knowing the levels of transpiration, or climate prognostics. Producers may have problems with water availability due to unpredictability of rain and lack of adaptation measures (e.g., reservoirs, irrigation systems), and may have higher risks of crop loss without projected information. Higher family cost for agricultural practices.</p> <p><b>Indirect:</b> Lower family income due to higher crop loss from lack of adaptation methods and info. Potential for more land</p>	<p><b>Direct effect:</b> Implementation of adaptation measures determined by project implementers based on best professional judgment (local historical experience) but does not use weather data or soil moisture. Technical assistance provided to producers. Water management technology, GAPs, and agricultural and processing technology increase production and help get crops to market. Water is more reliably available than under No Action.</p> <p><b>Indirect effect:</b> Higher income due to reduced crop loss following installation of adaptation measures, GAPs, and processing equipment for getting product to market. Reduced potential for land conversion.</p> <p><b>Cumulative effect:</b> Climate</p>	<p><b>Direct effect:</b> Strengthening of implementing partner capacity to use data from the meteorological stations in decision making, leading to better informed/prepared farmers regarding climate variabilities. Based on weather data and soil moisture, IPs can more accurately determine the need for adaptation measures. Once measures are in place, IPs could determine volume of water needed for irrigation and could adjust crop selection based on changing climates. Water use would be more efficient. This would make farmers more resilient than the PA actions and in theory result in increased yields/less loss Link between producers and other educational and research institutions provides continuity after project, which is not built in to the PA actions. Projects are more sustainable regarding climate impacts than PA Time and additional resources would be needed to gather climate data and make it</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
		<p>conversion to expand crops to make up for loss, potential to convert to other crops that may not have markets.</p> <p><b>Cumulative effect:</b> Lack of climate change adaptation—lack of irrigation, water systems, water harvesting reservoirs leading to crop failure and food insecurity. Crop failure also due to use GAPs that conserve soil and enhance crop resilience.</p>	<p>adaptation measures are installed and are overall effective. However, installation and choice of measure may not be prioritized based on best scientific data; thus measures may be excessive in some areas or insufficient in others. Crop selection and GAPs may sometimes be ineffective due to failure to use climate data.</p>	<p>usable for farmers. While data is being collected, the impacts would be similar to the Proposed Action. Long term positive impacts of having and using climate data would be greater than the Proposed Action as described above.</p> <p><b>Indirect effect:</b> Greater increase in family incomes over the long term compared to PA due to increased production and fewer costs; these are a result of more efficient production methods aided by meteorological info.</p> <p><b>Cumulative effect:</b> Meteorological data aids in understanding the local and regional effects of climate change. Climate adaptation technologies are optimized and prioritized according to available scientific data. Crop selection and GAPs are more effective.</p>

## 7.3 WATER RESOURCES AND WATERSHED MANAGEMENT

TABLE 25. ANTICIPATED ENVIRONMENTAL EFFECTS RELATED TO WATER RESOURCES AND WATERSHED MANAGEMENT OF THE PROPOSED ACTION AND ALTERNATIVES

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
8 Risk of source water protection failure	Upper watershed protection capacity by water boards and water districts.	No additional protection of source water.	A3 Source water protection A5 Watershed master plans F1 Water management technology for irrigation	Programs to declare upper watersheds as protected areas. Develop best practices for implementing ICF declaratory

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
	<ul style="list-style-type: none"> <li>None (there is no capacity at all)</li> <li>Some (there is some, insufficient capacity)</li> <li>Adequate (the boards were capable of independently completing tasks)</li> </ul>		F1.5 Water harvesting reservoirs F2 Potable water systems.	procedures; lobby to streamline declaration process.
		<b>Expected change in metric:</b> None	<b>Expected change in metric:</b> Some	<b>Expected change in metric:</b> Adequate
		<p><b>Direct effect:</b> Water quality and quantity diminishes due to the lack of upper watershed protection.</p> <p><b>Indirect effect:</b> Irrigation projects abandoned or not being implemented/nonexistent due to unreliable water source or poor water quality.</p> <p><b>Cumulative effect:</b> Increasing number of poor people with less food security, as people do not have sufficient water access for farming. Waterborne disease increases because source water is not protected and water treatment is not available. Other health effects resulting from chemical pollution.</p>	<p><b>Direct effect:</b> Improvement of water quality and water volumes at some sites due to installation of water capture technology and water systems that provide water storage and treatment. Source water protection and watershed master plans improve source water quality by preventing deforestation and incompatible use, establishing recharge areas, and by encouraging reforestation. Limiting agriculture under source water protection programs and watershed master plans reduces sedimentation problems.</p> <p><b>Indirect effect:</b> Some irrigation and potable water projects at risk as project is not able to reach all in need.</p> <p><b>Cumulative effect:</b> Water conflicts between users and upper watershed owners.</p>	<p><b>Direct effect:</b> Although capacity to establish source water protection areas will increase due to expansion of training, improvement in water quality and volumes may be slow at first as new processes for declaration are established. Once established, the impacts would be a greater positive impact than that of the Proposed Action as an increase of water (from recharge) and improved water quality (no extractive land use activities) would be anticipated. Extra time and resources would be needed to establish watershed protected areas. During this time the impacts would be the same as the Proposed Action.</p> <p><b>Indirect effect:</b> Few irrigation projects at risk, as new source water protection and recharge areas allow infiltration and more reliable flow. Although there may be increased water availability for downslope farmers, conflicts may result</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
				<p>due to the lack of available land for farming as upper watersheds would be in a protected area status and not available for farming unless permanent fruit /tree crops are allowed.</p> <p><b>Cumulative effect:</b> Improvement of water quality and water volumes at more sites than under PA due to more streamlined process for establishing protected areas. Few water conflicts between users and upper and downstream watershed owners due to increased water availability.</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
9 Diminished downstream water availability and water quality from over-extraction	<ul style="list-style-type: none"> <li>Improved water quality and quantity</li> <li>No change</li> <li>Decreased water quality and quantity</li> </ul>	<p>No water management for irrigation; no drinking water treatment or distribution</p> <p>Unrestricted landfill siting.</p>	<p>E4 Household improvements</p> <p>E5 Waste management and landfills</p> <p>F1 Water management technology for irrigation</p> <p>F2 Potable water systems.</p>	<p>In addition to Proposed Action, (1) Measure water extraction and use, and (2) Design and implement pilot water storage system for multiple purposes (agriculture and potable water) and ensuring equitable access for downstream users. The pilots should be designed for retention and storage for human use and, to the extent possible, for groundwater recharge and flood control. The systems should use gravity for water transport, and solar energy if pumping or disinfection is required. The scale of the projects should be in accordance with technical data derived from an impact assessment process. Provide capacity building for users and local governments on water management. Include sanitary practices in water systems, such as latrines or sewage systems and waste treatment plants, as well as health education. Designate landfill areas and design to avoid water source pollution.<sup>19</sup></p>

<sup>19</sup> Note that this activity was eliminated as an alternative. It was instead designated a mitigation action to be conducted in addition to the proposed action.

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
		<p><b>Expected change in metric:</b> Decreased water quality and quantity.</p> <p><b>Direct effect:</b> Less than minimum ecological flow left on the river due to excessive withdrawals. Diminishing availability of water downstream for other users or ecosystems.</p> <p><b>Indirect effect:</b> Downstream water conflicts due to reduced availability of water downstream. Elimination of aquatic food sources due to inadequate ecological flow.</p> <p><b>Cumulative effect:</b> Irreversible damage to ecosystems, especially if some species become extinct. Food insecurity due to insufficient water for agriculture and reduced income; possible health problems due to poor water quality.</p>	<p><b>Expected change in metric:</b> No change in water quantity. Improvement in water quality.</p> <p><b>Direct effect:</b> Improved water quality and improved availability of water for agriculture and household use due to installation of water management technology, potable water systems, household water harvesting and tanks. However, although water management technology is designed with a maximum flow to ensure users do not withdraw more than necessary, withdrawals do not take into account ecological flow. Design of technology does not account for changes in climate over time. Irregular or less than minimum ecological flow may be left on the river at draught due to lack of systematic water measurement and lack of data to determine minimum flow. Irregular or unknown availability of water downstream for downstream users or ecosystems.</p> <p><b>Indirect effect:</b> Elimination of aquatic food sources due to inadequate ecological flow is still possible. Water conflicts could still occur downstream, as</p>	<p><b>Expected change in metric:</b> Improved water quality and quantity.</p> <p><b>Direct effect:</b> Maintenance of minimum ecological flow due to more precise determination of water availability, household rainwater harvesting, and prioritization of ecological flow. Where water boards exist, they can use info to allocate available water. Improved water quality for wildlife and humans due to improved landfill siting and construction practices. Better use of water for all users. Time and extra resources would be needed to implement the data gathering and pilot storage activities. During this time, the impacts would be similar to No Action for sites outside of current intervention areas. Once water flow data and pilots are in place, there would be increased positive impacts to the ecology, agricultural production, and human health over the Proposed Action as water use would be based on data to regulate amount used. Use of water storage systems, especially capturing rainfall, would allow for extended irrigation periods during the dry</p>

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
			<p>proposed action for irrigation technology addresses predicted need but does not account for actual amount of water available, leaving insufficient water for downstream users.</p> <p><b>Cumulative effect:</b> Irreversible damage to ecosystems still possible due to insufficient flow, especially as demand for water increases with population and as climate changes.</p>	<p>season and allow for recharge in the upper watershed and more flow downstream.</p> <p><b>Indirect effect:</b> Availability of water downstream for other users or ecosystems; reduced conflict between users. Aquatic food sources continue to be available.</p> <p><b>Cumulative effect:</b> Minimal risk of irreversible damage to ecosystems because water quality and quantity are adequate for aquatic life. Improved ability to manage water resources due to improved data on water availability.</p>
10 Risk of water systems failure due to lack of financial resources, financial capacity, and technical capacity for maintenance and	Financial system for sustainability of irrigation and potable water systems (no system, some efforts, systems working).	No investment in farm technology and drinking water. No water management program.	A4 Water boards F1 Water management technology for irrigation F2 Potable water systems.	In addition to Proposed Action, establish financial plans specifying water system revenue requirements and rate adjustment plans to cover specified needs. Provide training to boards, etc. Boards set aside funds to cover depreciation. <sup>20</sup>

<sup>20</sup> Note that this activity was eliminated as an alternative. It was instead designated a mitigation action to be conducted in addition to the proposed action.

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
replacement.		<p><b>Expected change in metric:</b> No financial system.</p> <p><b>Direct effect:</b> Lack of local water resource knowledge and management, leading to conflicts and inefficient water use. Water system abandonment due to inability to pay for repairs and technical ability to make repairs.</p> <p><b>Indirect effect:</b> Interference and overuse of water by some users, due to inability of board to regulate water use, affecting other users. High risk of irrigation project failure if overall watershed management is not in place.</p> <p><b>Cumulative effect:</b> Not enough water for all users due to inefficient use or system failure. Increased poverty, hunger, and poor health outcomes.</p>	<p><b>Expected change in metric:</b> Some efforts to establish financial system.</p> <p><b>Direct effect:</b> Water boards are established, and existing boards improve capacity to manage watersheds, establish water and irrigation systems, and maintain such systems. Long term maintenance of irrigation systems and water source protection infrastructure is uncertain due to the lack of established financial plans and water fees not being based on a financial analysis.</p> <p><b>Indirect effect:</b> Overuse and conflicts begin to decline in the short term but conflicts may arise in the long term due to the potential for infrastructure to deteriorate due to the lack of funds for maintenance.</p> <p><b>Cumulative effect:</b> Not enough water for all users, as some systems may still fail, and rates may not be sufficient to regulate water usage and provide funding for repairs. Low likelihood of long term sustainability.</p>	<p><b>Expected change in metric:</b> Functional financial system.</p> <p><b>Direct effect:</b> Allocate and manage water at local level to maintain availability for all users. Some users may not be able to afford new rates. Greater long term positive benefits over the Proposed Action for the maintenance and sustainability of the water infrastructure.</p> <p><b>Indirect effect:</b> Fewer local water conflicts as water usage is managed through rate structure.</p> <p><b>Cumulative effect:</b> Water systems across the region are more sustainable as they collect sufficient revenue to pay for operation and maintenance. Some consumers may not be able to pay for water.</p>
11 Weak coordination	Number of Consejos de Cuencas formed or supported.	No coordination	A3 Source water protection A5 Watershed master plans	In addition to Proposed Action, establishment of and

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
between USAID projects, and between IPs and the government of Honduras (at local and national levels), due to independent project design and implementation.			C5 Production area expansion (fallow land) F1 Water management technology for irrigation. F1.5 Water harvesting F2 Potable water systems F3 Roads G1 Integration	participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos to discuss issues associated with economic development, the development of water resources, and forest use. <sup>21</sup>
		<b>Expected change in metric:</b> No change in number of consejos.	<b>Expected change in metric:</b> No change in number of consejos.	<b>Expected change in metric:</b> Increase in number of consejos.
		<b>Direct effects:</b> Without USAID involvement in projects, government or NGO projects may not address needs of the people or the government's priorities. Insufficient resources are devoted to projects.  <b>Indirect effects:</b> Poverty, environmental degradation, insufficient water resources, low agricultural yields due to lack of USAID projects.  <b>Cumulative effects:</b> Continued poverty, environmental degradation, low agriculture	<b>Direct effects:</b> Projects are designed to be complementary. Some coordination between projects occurs, as multiple projects are implemented by the same IP, and because IPs are expected to coordinate with each other under G1. However, there is little coordination with the Honduran government and no established procedure for ensuring IPs coordinate with each other. Projects may be redundant; IPs miss opportunities to learn from other IPs' experiences, Projects may not meet government priorities due	<b>Direct effects:</b> In addition to the effects of the proposed actions, IPs will attend meetings of the Consejos de Cuenca, which will ensure coordination of projects with water boards, local government, other IPs, and other stakeholders. Projects will be less likely to interfere with each other. Coordination will reduce redundancy as well. <b>Indirect effects:</b> Greater improvements in water quality and water availability, further improved agricultural yield compared to the proposed action. Increased chance of

<sup>21</sup> Note that this activity was eliminated as an alternative. It was instead designated a mitigation action to be conducted in addition to the proposed action.

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
		yields, insufficient water resources. Inability to meet development objective.	<p>to lack of governmental input. Some projects may unintentionally have negative impacts on other projects due to lack of coordination. Sustainability of USAID activities is in question as there would be no follow up or continuity by GoH or other organizations, especially as these natural resource activities take more than 5 years to implement.</p> <p><b>Indirect effects:</b> Improved water quality and water availability, improved agricultural yield, improved ability to get crops to market.</p> <p><b>Cumulative effects:</b> Project implementation may be inefficient due to lack of coordination.</p>	<p>sustainability after USAID closes projects as GoH and other organizations have been educated and participating in these activities, and thus in theory would have more of a vested interest in continuing support.</p> <p><b>Cumulative effects:</b> Projects do not conflict with each other and meet stakeholder needs due to improved coordination. Coordination between the ProParque, Mercado, and ACCESO projects, with GoH coordination and support (i.e., establishment of watershed reserves) would yield positive cumulative benefits as more sustainable ag production would occur with improved buffer zone plans that are prepared in harmony with downslope farmers and IPs.</p>
12 Increased social disparity as a result of limited participation in USAID projects within communities, exacerbating risk of	Number of Consejos de Cuencas formed or supported.	No on-farm improvements or connections of farmers to markets.	<p>F1 Water management technology for irrigation</p> <p>C12 Strengthen market linkages</p> <p>C13 Improve access to high-value markets through certifications.</p>	In addition to Proposed Action, establish and participate in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos de Cuencas to discuss issues associated with economic

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
migration and land clearing.				development, the development of water resources, and forest use. <sup>22</sup>
		<b>Expected change in metric:</b> No change in number of consejos.	<b>Expected change in metric:</b> No change in number of consejos.	<b>Expected change in metric:</b> Increase in number of consejos.
		<p><b>Direct effects:</b> Without proposed action, there would not be as much social disparity because there would be no project beneficiaries.</p> <p><b>Indirect effects:</b> However, water availability, water quality, crop failure, and poverty would still be problems. Deforestation and environmental degradation would occur. Producers would have difficulty selling crops outside the immediate area, and would be unable to export.</p> <p><b>Cumulative effects:</b> Failure to meet development objective since projects will not be implemented.</p>	<p><b>Direct effects:</b> Improved water availability due to installation of irrigation technology, which is designed to allow withdrawal of water based on area farmed. Improved access to markets due to market linkage programs and certification programs. These programs allow more people to sell goods in more markets and for better prices.</p> <p><b>Indirect effects:</b> Market linkage programs still have limited impact, and producers may not be able to achieve certification, causing social disparity.</p> <p><b>Cumulative effects:</b> Social disparities continue due to limited reach of programs.</p>	<p><b>Direct effects:</b> Those stakeholders who feel left out will have an opportunity to express their concerns through the consejos de cuencas. IPs attending these meetings can respond to these concerns with adjustments to programs, expanding program reach. Increased opportunities for active decision making participation among all through attending consejo's meetings compared to the Proposed Action.</p> <p><b>Indirect effects:</b> Social disparities decrease, reducing risk of migration and land clearing.</p> <p><b>Cumulative effects:</b> Greater community cohesion as consejos allow inequities to be</p>

<sup>22</sup> Note that this activity was eliminated as an alternative. It was instead designated a mitigation action to be conducted in addition to the proposed action.

ISSUE NO	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
				addressed.

## 7.4 BIODIVERSITY AND PROTECTED AREAS

TABLE 26. ANTICIPATED ENVIRONMENTAL EFFECTS RELATED TO BIODIVERSITY AND PROTECTED AREAS OF THE PROPOSED ACTION AND ALTERNATIVES

ISSUE NO.	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
13 Unsustainable tourism or community use of protected areas.	Number of protected areas in Corredor Seco with public use plans and implementing carrying capacity plans.  Number of demarcated protected areas in Corredor Seco by the end of the project.	Use of protected areas without regard to carrying capacity.	D1 Value chains that facilitate biodiversity conservation D2 Ecotourism promotion.	Conduct a carrying capacity study for each protected area in the Corredor Seco to determine the daily maximum number of tourists to be permitted access. Prepare a public use plan for each protected area to ensure land use is compatible with protected area status. Mark boundaries of protected areas with concrete or other markers.
		<b>Expected change in metric:</b> No change.	<b>Expected change in metric:</b> No change in number of protected areas implementing carrying capacity plans or in number of demarcated protected areas.	<b>Expected change in metric:</b> Increase in number of demarcated protected areas and number of carrying capacity plans.
		<b>Direct effects:</b> The carrying capacity of the protected area could be exceeded due to lack of data on carrying capacity. Expansion of agriculture in protected areas, continued degradation of the protected	<b>Direct effects:</b> The carrying capacity of the protected area could be exceeded due to lack of knowledge of carrying capacity. Continued degradation of the protected area and excessive use of natural resources in protected	<b>Direct and indirect effects:</b> The increased number of carrying capacity plans and demarcated protected areas would reduce the magnitude of the direct and indirect negative impacts related to No Action and the Proposed Action. Demarcation would reduce

ISSUE NO.	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
		<p>area, and excessive use of natural resources in protected areas due to lack of knowledge of borders. Ecological damage from tourists wandering into no access areas, taking souvenirs (flora or fauna) from the park, and hunting wild animals for pleasure. Accumulation of solid waste in the protected areas when tourists and residents do not deposit trash in designated areas. Erosion and poor drainage due to current road construction practices.</p> <p><b>Indirect effects:</b> Deforestation and loss of biodiversity due to overuse of protected areas. Continued growth and expansion of human settlements into protected areas. Increased demand for goods and services associated with tourism such as lodging, food, and local crafts, putting more pressure on protected areas. Loss of biodiversity due to hunting and extraction of other resources from the protected area. Increased amounts of solid waste, water, noise, and light pollution.</p> <p><b>Cumulative effects</b> Increase in pressure on protected</p>	<p>areas from encroachment due to lack of knowledge of borders. Erosion and deforestation during road maintenance conducted to support tourism. Accumulation of solid waste in the protected areas when tourists and residents do not deposit trash in designated areas. Activities under DI (strengthen value chains) are preliminary and may not immediately lead to improved biodiversity conservation. Capacity building (including sustainability certification) for ecotourism operators could help limit ecological impacts. Overall, the Proposed Action would have less negative impacts than the No Action as at least USAID IP actions would provide some focus to development within the Protected Areas.</p> <p><b>Indirect effects:</b> Potential Deforestation and loss of biodiversity due to overuse of protected areas and uncontrolled/unmarked boundaries. Continued growth and expansion of human settlements into protected areas. Accelerated rate of settlement due to improved roads built to facilitate tourism. Increased demand for goods and services associated to tourism such as lodging, food, and local</p>	<p>encroachment on and degradation of protected areas due to better knowledge of protected area borders. Carrying capacity plans would reduce the number of tourist facilities to a sustainable level and better focus the type and location of ecotourism within the park boundaries. Additional time and resources would be needed to carrying out these activities. The short term impacts while these activities are being carried out would be similar to the Proposed Action. Long term positive benefits as described above would be greater than the Proposed Action.</p> <p><b>Cumulative effects</b> The cumulative effects in No Action and Proposed Action are reduced. Without implementation of public use plans, however, the effects will continue. For instance, erosion can occur during road construction and maintenance without implementation of construction best management practices. A public use plan would ensure management of all land use in the protected area.</p>

ISSUE NO.	METRIC FOR COMPARING ENVIRONMENTAL IMPACT	NO ACTION	PROPOSED ACTION	ALTERNATIVE
		<p>areas due to increase in tourism from the completion of the Lenca Trail and the Coffee Route. Effects will be cumulative based on the number of protected areas without demarcation.</p>	<p>crafts, putting more pressure on protected areas. Loss of biodiversity due to hunting and extraction of other resources from the protected area. Value chain activities in the proposed action are preliminary and may not have an immediate impact on biodiversity. Increased amounts of solid waste, water, noise, and light pollution.</p> <p><b>Cumulative effects:</b> Increased pressure on protected areas due to increase in tourism from the completion of the Lenca Trail and the Coffee Route. At the same time, agroforestry that promotes biodiversity conservation will generate sufficient income to reduce pressure on forests from hunting and other resource use and will encourage preservation of biodiversity. Small-scale ecotourism and ecotourism certification will limit the impacts of individual facilities, although the total number of facilities may be unsustainable.</p>	

## 7.5 CUMULATIVE EFFECTS SUMMARY

The cumulative effects of the No Action Alternative are a perpetuation of the status quo across the region. Without USAID's interventions—that are broadly designed to sustainably manage natural resources by increasing agricultural productivity, access to markets, and increase incomes—the current conditions of poverty will persist. The Government of Honduras and other donors are active in the region, but the lack of security (e.g., from drug cartels), weak government institutions, and weak market linkages continue to be major hurdles to development.

The Proposed Action, implemented on a stand-alone basis, presents a major near-term opportunity for development and the promotion of practices that would better manage soil resources and develop water resources. With the exception of the ProParque sites, the current intervention sites are those of the legacy ACCESO project plus sites along the existing routes for field technicians. These current intervention sites are spread across the western region and in numerous micro-watersheds. In many cases, the sites that are currently most successful are those where the communities were most “willing to work” and where the security situation is favorable for technical staff (i.e., historically some sites were dropped because of crime or robbery in the area). As a result, USAID's area of influence in the Proposed Action is broad, but spread very thin. Especially in terms of sustainably managing water as the critical resource in the area. The positive economic and environmental results from the Proposed Action are incremental and positive (i.e., increasing steadily over time) and build off of USAID's historical interventions. However, the long-term success of the projects depends on the adequacy of water resources—including the development/use of water resources by USAID beneficiaries and the use of resources by beneficiaries outside of USAID's direct ability to influence (e.g., neighboring farms). Therefore, even with the sustainable use and management of lands, pesticides, and water on the farm, and the development of market linkages, those beneficiaries are still at risk from negative environmental and economic spillovers from development, deforestation, and environmental degradation in neighboring areas.

The Alternative was developed with these issues and potential risks in mind. As a protected area- and watershed-focused approach to development, the Alternative would focus additional resources on a few sub-watersheds. Within these sub-watersheds, and due to the comprehensive water and land use planning conducted in advance of project implementation, the cumulative effects of the USAID interventions would be strongly positive. Water development and use would be in-line with sustainable levels of extraction and minimum stream flow requirements. Farmers and communities in the entire watershed would benefit not only from the direct interventions, but the positive environmental, social, and economic spillovers from those interventions in other adjacent communities within the watershed. The entire value chain in these targeted geographic areas would be strengthened. Better information from weather stations would inform annual decision-making better and access to climate data would inform long-term decision-making by farmers. The use of RUPs within the sub-watersheds would be dramatically lower than in other areas in the region because of USAID's interventions on the supply- and demand-side. With regard to biodiversity and protected areas, the cumulative effects of the Alternative approach would be improved demarcation and protection, and lower encroachment pressure from areas receiving USAID interventions.

## 8. FINDINGS / RECOMMENDATION

USAID has been active in the western Honduras region and the Proposed Action is largely a continuation and expansion of historic agricultural activities intended to reduce poverty and protect natural resources, which serve as natural capital for the rural Honduran economy. Compared to past projects, the Proposed Action has important modifications and scope expansions to include watershed management and rural electrification.

Recently completed USAID projects (e.g., ACCESO) and ongoing projects comprising the Proposed Action have made important advancements to protect the environment and sustainably increase incomes for vulnerable populations. As a result, the anticipated environmental effects of the Proposed Action are more beneficial than the No Action Alternative. However, the long-term sustainability of the Proposed Action could be improved in terms of watershed management, coordinated development within watersheds, and the sustainability of market access.

Compared to the Proposed Action alone, **the Alternative would provide an additional complimentary route to development in western Honduras that emphasizes a protected area- and watershed-focused approach to development.** The additional elements of the Alternative enhance the Proposed Actions from a technical aspect and would implement watershed planning and pilot actions in key selected watersheds, while implementing the Proposed Action ongoing activities in the same existing areas.

TABLE 27. DISTINGUISHING CHARACTERISTICS OF THE ALTERNATIVES

ALTERNATIVE	DISTINGUISHING TECHNICAL ASSISTANCE CHARACTERISTICS	DISTINGUISHING GEOGRAPHIC APPROACH
No Action	Continuation of the status quo environmental and development scenario in western Honduras absent any and all USAID intervention (e.g., limited soil conservation and irrigation on farms, limited pesticide management, limited source water protection, no extension/technical assistance from USAID Activities).	N/A
Proposed Action	Direct on-farm capacity building and technology introduction, protection and development of water resources for irrigation, development of agricultural value chains, rural electrification, and road planning.	Interventions targeted in geographic areas historically supported by USAID plus new immediately adjacent sites.
Alternative	<p>Direct on-farm capacity building and technology introduction, protection and development of water resources for irrigation, development of agricultural value chains, rural electrification, and road planning</p> <p>+</p> <p>For new/additional activities, work through a local third party (e.g., buyers or a non-governmental organization) to provide technical assistance</p> <p>Manage social effects and water resources through strengthened Consejos de Cuencas</p> <p>Increased Planning and data gathering in watershed management, climate change, and protected areas carrying capacity for tourism.</p> <p>Piloting of water storage for potable water and irrigation.</p>	<p>Interventions targeted in geographic areas historically supported by USAID plus new immediately adjacent sites</p> <p>+</p> <p>For new/additional activities, interventions falling within (i.e., organized by) targeted watersheds and micro watersheds—one in each department.</p>

The PEA describes the reasonable anticipated environmental effects of No Action, the Proposed Action, and the Alternative. The environmental consequences analysis required by 22 CFR 216.6(c)(3) is conducted using metrics for comparison.<sup>23</sup>

As shown in Table 28, the No Action alternative has the greatest adverse environmental effects overall. Because the activities that make up the Proposed Action are already underway and because the Alternative would require a data-driven and planning-intensive approach that would take several years to fully implement, the analysis and implementation of new Alternative actions based on the data and planning would be implemented within a 1 to 3 year timeframe while the Proposed Actions are continuing.

**TABLE 28. SUMMARY OF EFFECTS FOR ALTERNATIVES**

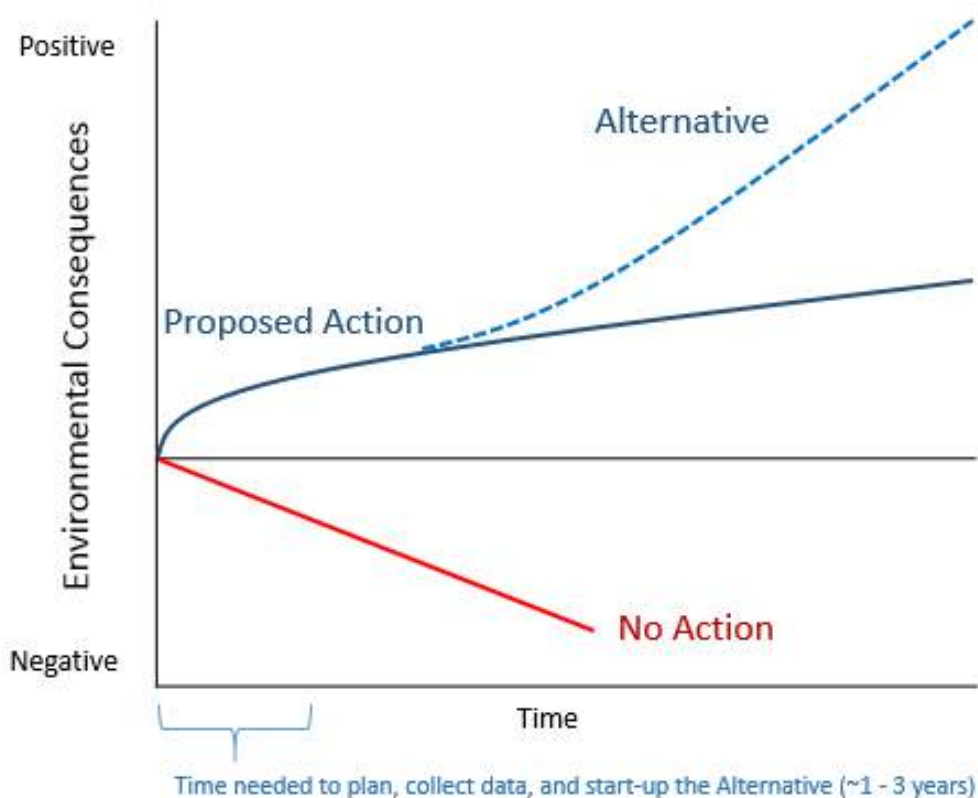
ALTERNATIVE	SHORT-TERM EFFECTS	LONG-TERM EFFECTS	CUMULATIVE EFFECT
No Action	Greatest adverse effect.	Greatest adverse effect.	Greatest adverse effect.
Proposed Action	Short-term positive effect on the significant issues because the activities are underway and mitigation measures are sufficient.	Without additional measures some adverse effects or not fully mitigated or avoided.	The Proposed Action has a low negative social and environmental impact in the short-term because the activities are underway and mitigation measures are sufficient, but over time benefits of the Alternative exceed the benefits of the Proposed Action.
Alternative <b>RECOMMENDED</b>	Short-term positive effect on the significant issues because the activities are underway and mitigation measures are sufficient	Greatest long-term positive effect on the significant issues because additional activities are designed for environment	The Alternative has the lowest adverse social and environmental impact overall as it includes all of the Proposed Actions and additional actions that address cumulative impacts through additional extension and integrated planning actions.

While the environmental benefits of the Alternative are substantive and would yield long-term sustainable results, the Assessment Team found that without the simultaneous implementation of the Proposed Action (i.e., existing projects already under contract) some avoidable adverse environmental impacts would result due to the stoppage of the Proposed Action. Thus the Alternative has included all of the Proposed Actions that would continue while the planning/data gathering actions of the Alternative are being done. Because the Alternative and the Proposed Action are not mutually exclusive they would be conducted concurrently to achieve the greatest environmental benefit (as shown in the figure below). The Alternative enhances the ongoing Proposed Actions. USAID could fund the Alternative or elements of the alternative through a separate contract (or modify existing contracts) to build on the Proposed Action, laying the framework for sustainable long-term watershed-based development. The Alternative proposes the comprehensive delineation and protection of the source waters for water irrigation and potable water projects to assure quality and quantity (i.e., an approach to fully planning for development in the watersheds, including USAID projects and identifying water allocations for all current users). As shown in the figure below, implementing the Alternative—or components of it—in addition to the Proposed Action would help assure the long term

<sup>23</sup> For the purposes of environmental effects analysis, a metric for comparison was established in Section 6 for each issue. In the majority of cases a qualitative metric was used due to the overwhelming lack of detailed baseline environmental information and monitoring.

sustainability and resiliency of producers and markets and climate changes, extend the useful life of infrastructure, and the safeguard of natural resources and ecosystem services in the western area of Honduras.

Therefore, the PEA recommends that the Alternative also include the implementation of all of the actions listed in the Proposed Action.<sup>24, 25</sup> in addition to the new actions listed for the Alternative. As shown in the summary table below and in the following figure, this approach will ensure that DO2 is achieved with the greatest positive effect on the significant issues identified.



<sup>24</sup> The Proposed Action is defined in Section 4 to include existing mitigation measures in approved EMMPs.

<sup>25</sup> One of the elements of the alternative is installation of a pilot water storage system (for irrigation and domestic use)). This system would allow USAID and stakeholders in each department to fully understand the environmental and social benefits and risks of these types of systems over time. If more than one water storage system is developed in each department, the Assessment Team recommends that a stand-alone supplemental Environmental Assessment be conducted to further define mitigation measures.

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## ANNEXES

Annex A. Additional Mitigation Measures for the Proposed Action

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## ANNEX A. ADDITIONAL MITIGATION MEASURES FOR THE PROPOSED ACTION

DESCRIPTION OF THE ADDITIONAL MITIGATION MEASURES FOR THE PROPOSED ACTION	RESPONSIBLE PARTY	INDICATOR / METRIC	METHOD	FREQUENCY	COST ESTIMATE <sup>26</sup>
Each project which doesn't have an environmental officer should hire one. The environmental officer should report to the Chief of Party.	Chief of Party is responsible for hiring the Environmental officer.	Number of projects with Environmental Officer by July 2016.	Verify contract of Environmental Officer.	Twice per year.	
Environmental officers meet as a group with the MEO to coordinate, discuss environmental compliance and other environmental issues.	The MEO will call the meetings.	Number of meetings per year.	Record of meetings.	Quarterly beginning in March, 2016.	
Financial plans specifying water system revenue requirements and rate adjustment plans to cover specified needs. When installing irrigation systems, farmers and/or cooperatives need to set aside funds to cover the depreciation costs of (1) the distribution system, (2) filters, (3) intakes and maintenance. Rates should also cover operating and maintenance costs. This will require training and enforcement to ensure that costs are calculated appropriately and the rationale for these costs is understood.	Environmental Officer of the IPs working with: President of Caja Rural OR President of irrigation District.	Number of community water boards with financial plans that have a line item and adequate funding for depreciation. Rate charge at each project Nonpayment rate (mora).	Financial report.	Monthly.	
Establishment of and participation in Consejos de Cuencas. In the watersheds where activities take place, support and attend annual meetings of the Consejos de Cuencas to discuss and resolve issues associated with economic development, the development of water resources, and forest use. The composition of the Consejos is specified by the Water Law and includes municipal governments, farmers groups, and other stakeholders making land development and water development decisions and therefore can help ensure	IP	Number of Consejos de Cuencas formed or supported Number Water Master Plans # Conflicts solved by Consejo de Cuenca Advance on implementation of master	Consejos de Cuenca registered at Miambiente Water Master Plans documents # conflicts registered by Consejos de Cuenca. #actions in each Master	Annually.	

<sup>26</sup> TO BE COMPLETED BY THE IMPLEMENTING PARTNER

DESCRIPTION OF THE ADDITIONAL MITIGATION MEASURES FOR THE PROPOSED ACTION	RESPONSIBLE PARTY	INDICATOR / METRIC	METHOD	FREQUENCY	COST ESTIMATE <sup>26</sup>
that USAID projects are consistent with other local development plan and actions, and do not exacerbate existing social disparities and problems.		Plans.	plan implemented.		
Measure water extraction and use.	IP	Water flow Water quality.	Flow meter Direct sampling.	Quarterly.	
Design and implement pilot water storage system for multiple purposes (agriculture and potable water) and ensuring equitable access for downstream users. The pilots should be designed for retention and storage for human use and, to the extent possible, for groundwater recharge and flood control. The systems should be designed to utilize gravity for water transport, and then utilize solar energy if pumping or disinfection is required. The scale and the selection of the projects should be in accordance with technical data derived from an impact assessment process. Promoting water storage either for infiltration or for consumption will have a direct effect on resilience for drought and also for reduction of downstream flooding. The infrastructure investment should be complimented by capacity building for users and local governments on water management so that the systems comply with applicable laws and support equitable water use.	IP	Water storage systems are designed for multiple uses.	Design review by the MEO to determine if the scale of the projects require environmental analysis beyond what has been prepared by the Implementing Partner (i.e., does the project trigger a stand-alone environmental impact assessment?)	At design stage.	

## ANNEX B. HONDURAN POLICY AND INSTITUTIONAL FRAMEWORK

LAW/REGULATION	DECREE/AGREEMENT NUMBER
Ley del Instituto Hondureño de Turismo.	Decreto 103–93; mayo 27, 1993.
Ley para la declaratoria, planeamiento y desarrollo de las zonas de turismo.	Decreto 968; La Gaceta 23,160; Julio 22, 1980.
Contrato de préstamo suscrito entre el Estado y el Banco Interamericano de Desarrollo para la ejecución del Proyecto de Manejo Ambiental de Islas de la Bahía.	Decreto 180–95; La Gaceta; Diciembre 9, 1995.
Ley de estímulo a la producción, a la competitividad y apoyo al desarrollo humano (Reforma la Ley del Instituto Hondureño de Turismo y crea la “tasa por servicios turísticos”).	Decreto 131–98; La Gaceta 28, 566; Mayo 20, 1998;
Ley para la protección del patrimonio cultural de la Nación.	Decreto 81–84; La Gaceta 24, 387; Agosto 8, 1984.
Ley Orgánica del Instituto Hondureño de Antropología e Historia.	Decreto 118; octubre 31, 1968.
Ley General del Ambiente.	Decreto 104–93; La Gaceta; Junio 30, 1993.
Ley Forestal.	Decreto 85; La Gaceta 20,620; Marzo 4, 1972.
Ley Forestal, Áreas Protegidas y Vida Silvestre.	Decreto legislativo 98–2007; La Gaceta Septiembre 13, 2007
Protección de Suelos y Agua (Ley Forestal, Áreas Protegidas y Vida Silvestre).	Decreto legislativo 98–2007; Capítulo V, artículos 120 a 125.
Ley de los Bosques Nublados.	Decreto 87–87.
Ley de Municipalidades.	Decreto 134–90; octubre 29, 1990; reformado por Decreto 48-91.
Reglamento del Sistema Nacional de Areas Protegidas de Honduras.	Acuerdo 921–27; La Gaceta 28,978; Septiembre 25, 1999.
Reglamento del Sistema Nacional de Evaluación de Impacto Ambiental.	Acuerdo; Diciembre 17, 1993; La Gaceta 27, 291; Marzo 5, 1994.
Reglamento de la Ley General del Ambiente.	Acuerdo 109–93; La Gaceta 27,267; Febrero 5, 1994.
Reglamento especial para el traspaso de títulos al Estado o expropiación de bienes inmuebles en las zonas de turismo.	Acuerdo 136; La Gaceta; Noviembre 18, 1981.
Reglamento General de Salud Ambiental.	Acuerdo 0094; La Gaceta 28, 593; junio 20, 1998.
Acuerdo de creación de la Comisión Nacional de Ecoturismo.	Acuerdo 1117–92. La Gaceta 26, 816; agosto 10, 1992.
Reserva del hombre y de la biósfera en la cuenca del río Plátano.	Decreto 977; La Gaceta 23,181; agosto 15, 1980.
Ley General de Aguas.	Decreto 181–2009 Gaceta N° 32088 del Lunes 14 de Diciembre, 2009.
Ley Marco del Sector Agua y Saneamiento.	Decreto Legislativo No. 118–2003, de fecha 20 de agosto de 2003.
Ley de Promoción a la Generación de Energía Eléctrica con Recursos Naturales Renovables.	Decreto Legislativo No. 70–2007 Gaceta 2 de octubre del 2007.
Reforma Ley de Promoción a la Generación de Energía Eléctrica con Recursos Naturales Renovables.	Decreto Legislativo No. 138–2013 Gaceta No. 33,191 1 agosto 2013.
Ley del Fono Vial.	Decreto 131–93 y 286–98 Gaceta 27 de enero de 1999.

## NATIONAL ENVIRONMENTAL POLICY (REPRODUCED FROM USAID, 2014B)

Since the late 1970s, Honduras has gained experience in socioeconomic, environmental, and land use planning. The most recent effort is the medium and long term National Plan (2010–2022) and a Country Vision to 2038, which was approved by congressional decree (Congreso Nacional, 2009). The Country Vision and National Plan is a pilot effort to implement regional and local land use planning in compliance with the Land Use Law; this includes the Protected Areas System. All sectors are integrated with an environmental perspective. SEPLAN was created with regional offices to oversee 16 territorial divisions based on watershed and political boundaries (SEPLAN, 2011).

The main constraints/limitations/challenges of national environmental plans and strategies are the following:

- Drafted and approved environmental plans and strategies are oftentimes not based on existing and reliable baseline data and do not use data to inform plans and policies.
- Continuity of policy guidance regarding government priorities and actions is uncertain beyond the current administration.
- Drafting and planning requires time, human and budget resources, and political will to implement strategies and plans.
- Government oftentimes does not have enough resources or does not allocate enough resources to implement the strategies and plans, causing a reliance on foreign financial support.
- Implementation is lacking at local levels due to a lack of technical capacity and poor dissemination of strategies and plans to the public.

## NATIONAL ENVIRONMENTAL LEGISLATION (REPRODUCED FROM USAID, 2014B)

The 1982 Constitution of Honduras declared the conservation of protected areas (Article 172) and the rational and equitable use of natural resources (Article 340) of public interest and benefit. In addition, the National Congress has enacted extensive legislation (53 general laws, regulations, executive orders, and norms) related to environmental management and the sustainable use of forests and biodiversity.

The newly elected 2014–2018 government of Honduras is implementing a “policy modernization and priority program,” that includes reforms to streamline Public Administration Law in an effort to reorganize the Executive Branch of the government. As a part of this process, legal reforms will be submitted to Congress to streamline and update environmental and natural resource laws and regulations. Of particular priority are those related to the delegation of authority, decentralization-regionalization processes, budget allocation and savings, and the simplification of administrative and procurement procedures. As a result, much-needed changes in the General Law for the Environment and the Forestry, Protected Areas, and Wildlife Law are expected.

The purpose of the reorganization process is to improve public services at the regional and local levels and to enhance budget- and cost-effectiveness within the ICF and the new Ministry of Energy, Natural Resources, Environment and Mining (SERNA). The former will be merged into SERNA as a Vice Ministry, but with the intent of maintaining the authority and independence that it possesses according to forest law. Outcomes of the reorganization process will be assessed at the end of 2017.

Governance within Honduran law enforcement and institutional frameworks is hindered by many factors, including:

- A cumbersome legal process and judicial system.
- Ongoing conflicts and contradictions between development projects and environmental policies. This is particularly true for environmental impact assessment regulations, guidelines, and policies.
- Weak government presence at the field level, including SERNA, ICF, National Police, the Special Environmental Attorney Office of the Public Ministry, and environmental branch of the Army.
- Absence of a National Forest Ranger Service (Guardería Forestal de Áreas Protegidas y Vida Silvestre), as stipulated in the Forestry Law.
- Political manipulation of the Public Service Law, which reduces the effectiveness and continuity of career environmental professionals and technicians. This leads to a high turnover of public servants at the beginning of new government terms, and hinders long-term progress.
- Low investment focus on strengthening local law enforcement capacity and improving legal responses to environmental crimes, including the investigation, prosecution, and judicial process of illegal activities.
- “Social audits” and public participation processes are weak despite the many local, municipal, departmental, and national Participatory Councils organized and registered by ICF (as mandated in the forestry law). Their role as a consulting group is limited and ineffective due to personal safety and security issues.
- Conflicts in natural resource management and use stemming from legal contradictions; lack of coordination; legal gaps; and overlap in mandates, responsibilities, and practices by institutions dealing with land titling in public forests. This includes protected areas, agrarian reform, mining concessions, coffee farming and land titling, and current agricultural and credit policies.
- Lack of funding and technical capacity in almost every municipality and municipal association.

The Ley Marco del Sector Agua y Saneamiento generate the National Council for potable Water and Sanitation as a superior organism and regulatory agency of domestic and sanitation services.

In summary, the Honduran legal framework will have to be upgraded in order to eliminate the contradictions and conflicts of interest that currently exist among law enforcement, overlapping mandates, legal gaps, and poor agency coordination. A cross-sectoral approach to all environmental policies and guidelines will be critical, in order to effectively harmonize these policies and reinforce the government mandate to manage the environmental and biodiversity implications of all development projects.

## ANNEX C. HOW GAPS FROM SCOPING WERE ADDRESSED

NEEDS IDENTIFIED DURING SCOPING OR SPECIFIED IN THE TERMS OF REFERENCE FOR THE PEA ANALYSIS	WHAT WE DID... CUMPLIMOS LOS REUNIONES? ENCONTRAMOS LOS DATOS?
CONDUCT MEETINGS WITH STAKEHOLDERS (E.G., NGOS AND OTHER DONORS)	
Agua Para el Pueblo	Meeting completed, see Annex C for Persons Consulted.
Care	Meeting completed, see Annex C for Persons Consulted.
World Vision	Meeting completed, see Annex C for Persons Consulted.
Save the Children	Meeting completed, see Annex C for Persons Consulted.
fhi360	No meeting needed, fhi360 is only working on the North Coast.
GIZ	Meeting was not completed with donor.
NGOs that specialize on potable water, energy, agriculture, etc.	Meeting completed, see Annex C for Persons Consulted.
NEXOS	Determined unnecessary in consultation with USAID.
CONDUCT ECONOMIC ANALYSIS	
Local economies and social dynamics depending on data availability. <sup>27</sup>	Data were are not available to estimate the costs for Traditional Agricultural Systems and data were not available from IPs to determine the costs of technologies in the Proposed Action.
Simple cost benefit report of the GAPs package vs a traditional system	Data were are not available to estimate the costs for Traditional Agricultural Systems and data were not available from IPs to determine the costs of technologies in the Proposed Action.
INFORMATION NEEDED FROM GOVERNMENT OF HONDURAS OR NGOS	
Socioeconomic study for three protected areas: Panacam, Celaque and La Tigra (currently under review by the President)	Document is in draft form and was not available to the Assessment Team for review.
Plan de nación y visión del País (to 2038)	Documents received.
Proyecto de vida mejor (doc Estado)	Documents received.
Illegal logging rates	Not available (received in draft form).
Baseline availability of RUPs and mitigation measures to limit the availability of RUPs (from Servicio Nacional de Sanidad Agropecuaria (SENASA)).	List of RUPs were not available to the Assessment Team from SENASA. SENASA said all pesticides being used are registered with the government.
Agricultural waste practices.	Field observations used. No centralized/aggregated data were available.
Solid waste management practices (level of adoption of waste disposal/recycling of crop residues and production methods including at the coffee processing factories, and measures to mitigate the adverse environmental effects of waste)	Field observations used. No centralized/aggregated data were available.

<sup>27</sup> Field observations indicated that within communities USAID projects may be creating winners and exacerbating the differences between beneficiaries and non-beneficiaries.

NEEDs IDENTIFIED DURING SCOPING OR SPECIFIED IN THE TERMS OF REFERENCE FOR THE PEA ANALYSIS	WHAT WE DID... CUMPLIMOS LOS REUNIONS? ENCONTRAMOS LOS DATOS?
Identify which non-native species are being used in protected areas (specifically zona de motivación) (ICF)	Information was requested but never received.
Data on water storage in the Western departments	Data are not available for the West, only for Southern Departments.
INFORMATION NEEDED FROM USAID	
A table with each of the contracts/program and contactors (e.g., ACCESO a MERCADO implemented by Fintrac) contract value, and duration of the contract	Partial information received.
Terms of Reference for Chemonics or their draft Work Plan. Luis Caballero will provide us comments on the Proposed Action, but more detail will still be helpful in the long-run	We met with Luis and clarified the scope of the Chemonics contract. As a result some of the Alternatives were modified since part of the Alternatives overlapped with the Proposed Action.
Draft or approved EMMPs for the contracts/projects	The general EMMPs were received and reviewed by the Assessment Team.
INFORMATION NEEDED FROM IMPLEMENTERS	
One design/plan of an irrigation water catchment and irrigation system	Requested but not received.
Information on the cost of implementing a GAP package over a 2 year period and the benefits information for farm income increases over a 2 year period to develop a simple cost benefit report of the GAPs package vs a traditional system	Data are not available for this level of analysis.
Locations and functional status of meteorological stations installed by the projects (e.g., ProParque and ACCESO)	Received from ProParque in SUMMARY OF DIAGNOSTIC WEATHER STATIONS IN WESTERN HONDURAS
Details of mitigation measures from Honduras Quality Coffee	Mitigation measures were not available to the Assessment Team from HQC.
OTHER	
Information on the contracts/program values and duration of the contracts	Received partial information on ACCESO, no other information received.
ACS/Chemonics draft rapid feasibility study for selected irrigation projects (hydrologic and economic feasibility)	Que están evaluando los que les entregaron acceso, pero que acceso los construirá.
ACS/Chemonics draft roads intervention selection plan (geographic priority areas)	N/A Project was cancelled.
Differences in water use rights across departments/municipalities, and measures for harmonizing (up) the water user rights	<p>The Ley de Agua gives the municipalities and the Juntas Administradoras the responsibility for managing and operating water services including user rights and tariffs. In smaller communities it is the Juntas de Agua provide this service.</p> <p>ERSAPS (Ente Regulador de los Servicios de Agua Potable y Saneamiento) was created to serve as a regulatory and advisory body for municipalities and</p>

NEEDs IDENTIFIED DURING SCOPING OR SPECIFIED IN THE TERMS OF REFERENCE FOR THE PEA ANALYSIS	WHAT WE DID... CUMPLIMOS LOS REUNIONS? ENCONTRAMOS LOS DATOS?
	<p>Juntas de Agua. The Municipalities and Juntas de Agua are not bound by law to follow the advice of ERSAPS. Obligatory agreements between the Juntas de Agua y ERSAPS would harmonize and standardize water user rights and tariffs.</p>
Detailed environmental flows data to establish an adequate of baseline environmental flows, and measures to adequately address environmental flows.	<p>Water measurements are not available at the upper streams that are typically the source waters for USAID interventions. Historical data are not available at existing sites or across the 6 departments.</p>

## ANNEX D. LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

NAME	ORGANIZATION	TITLE
[REDACTED]	Acceso a Mercado	Gerente Producción Supervisor Regional
[REDACTED]	Acceso a Mercado	Gerente Post Cosecha
[REDACTED]	Acceso a Mercado	Coordinador Ambiental Especialista Manejo de Recursos Naturales
[REDACTED]	Acceso a Mercado	Sub Director / Técnico de zona
[REDACTED]	Acceso a Mercado	Gerente de Producción
[REDACTED]	Acceso a Agua	Deputy Chief of Party
[REDACTED]	Acceso a Agua	
[REDACTED]	Acceso a la Producción	Sub Director
[REDACTED]	Comité Ejecutor de Proyecto (CEP) en San Antonio del Norte	Presidente
[REDACTED]	Cooperativa Regional Agroforestal, Agricultores Unidos (COPRAUL) Plan del Rancho	Administradora
[REDACTED]	Departamento de Áreas Protegidas	
[REDACTED]	Departamento de Vida Silvestre (DVS)	Forestry Technical Expert
[REDACTED]	DIBIO	Environmental Analyst
[REDACTED]	Dirección de Ciencia y Tecnología Agropecuaria	Subdirector
[REDACTED]	Dirección General de Recursos Hídricos (DGRH)	Chief of Governability
[REDACTED]	Distrito de Riego La Comunidad	Presidente
[REDACTED]	Distrito de Riego La Comunidad	Secretario
[REDACTED]	FHIS PODER	Capacitador
[REDACTED]	Grupo Indígena Maya-Chorti San Rafael	Consejero Mayor (Presidente)
[REDACTED]	Honduran Quality Coffee	Engineer
[REDACTED]	ICF	Biological Technical Expert Forestry Technical Expert
[REDACTED]	ICF	Técnica de AP
[REDACTED]	ICF	Forestry Technical Expert
[REDACTED]	Instituto Hondureño del Café (IHCAFE) Santa Rosa de Copán	Coordinador de Agroforestería
[REDACTED]	Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre (ICF)	Biological Technical Expert
[REDACTED]	Acceso a Mercado	Gerente de Zona
[REDACTED]	MiAmbiente	Assistant Director

NAME	ORGANIZATION	TITLE
	MiAmbiente	Director Gestión Ambiental
	MiAmbiente	Director Biodiversidad
	MiAmbiente	Environmental Analyst
	FHIS PODER	Renewable Energy Specialist
	FHIS PODER	Supervisor Energía Renovable
	ProParque / DAI	Chief of Party
	Proyecto Competitividad Rural. Sinuapa	Administradora
	SAG	Director
	SAG	Subdirector
	Sistema de Riego	Presidente
		Forestry Technical Expert
		Gerent de Zona
	Save the Children	Gerente FORPAZ
		Gerente Region Sur
		Gerente Region Occidente
	World Vision	Coordinador, Monitoreo Evaluacion
	CRS	Director
	GOAL	Director
	CARE Agua para el Pueblo	Director
	PMA, Secretaria de Salud y SAG	
	Asociación de Productores Lencas de Hortalizas y Frutas	
	Science School UNAH	Dean

## ANNEX E. REPRESENTATIVES IN CONSEJOS DE CUENCAS

Definido en Ley General de Aguas

- 1) Oficinas Regionales del Gobierno Nacional integradas al Consejo Nacional de Recursos Hídricos;
- 2) Gobiernos Municipales cuyos territorios se sitúen, aunque sea parcialmente, en sus respectivas áreas de actuación;
- 3) Dos (2) representantes de Unidades administradoras de áreas protegidas;
- 4) Dos (2) representantes de organizaciones de usuarios del agua;
- 5) Dos (2) representantes de organizaciones campesinas;
- 6) Dos (2) representantes de organizaciones comunitarios (patronatos)
- 7) Dos (2) representantes de organizaciones ambientalistas;
- 8) Dos (2) representantes de organizaciones productivas vinculadas al esquema hídrico;
- 9) Dos (2) representantes, si lo hubiese, de la Asociación de Pueblos Autóctonos y Afrodescendientes de Honduras;
- 10) Dos (2) representantes de Consejos de Sub-cuenca;
- 11) Dos (2) representantes de Consejos de Micro-cuenca;
- 12) Dos (2) representantes de las Juntas Administradoras de Agua, escogidas de común acuerdo; y,
- 13) Dos (2) representantes de los Consejos Consultivos Forestales.

El Consejo Nacional esta integrado por:

- 1) El Secretario(a) de Estado en los Despachos de Recursos Naturales y Ambiente, que lo presidirá;
- 2) El Secretario(a) de Estado en los Despachos de Salud;
- 3) El Secretario(a) de Estado en los Despachos de Agricultura y Ganadería;
- 4) El Secretario(a) de Estado en los Despachos Obras Públicas, Transporte y Vivienda;
- 5) El Secretario(a) de Estado en los Despachos de Relaciones Exteriores;
- 6) El Secretario(a) de Estado en los Despachos de Gobernación y Justicia;
- 7) El Presidente(a) de la Asociación de Municipios de Honduras (AMHON);
- 8) Un(a) representante de la Comisión Permanente de Contingencias (COPECO);
- 9) Un(a) representante de la Universidad Nacional Autónoma de Honduras (UNAH);
- 10) Un(a) representante de la Asociación de Agricultores y Ganaderos de Honduras;
- 11) Un(a) representante del Consejo Hondureño de la Empresa Privada (COHEP);
- 12) Un(a) representante de todos los Consejos de Cuencas del país;
- 13) Un(a) representante del Instituto de Conservación Forestal, Áreas Protegidas y Vida Silvestre (ICF);
- 14) El Director(a) Ejecutivo(a) de la Autoridad del Agua, que fungirá como Secretario(a) del Consejo; y,
- 15) Un(a) representante de las Confederaciones Campesinas de Honduras.

## ANNEX F. PHOTOGRAPHS

A full inventory of photos taken by the Assessment Team are available at: <https://drive.google.com/open?id=0ByzSPR05N5lPb2U3MjVSTHd4dlU>

1. Agroforestry system with coffee in certification process at Cruz Alta, Lempira



2. Site to clean the pesticide equipment at Cruz Alta, Lempira



3. Erosion control measures at Distrito de Riego El Balsamo, Copán



4. Efficiency oven for Panela production at Llanito Verde, Campuca, Lempira



5. Grupo Mixto meeting at Asacualpa, Yamarangula



6. Automatic filters examples (all filters installed are similar) at Rodeo El Pinar, Gracias, Lempira



7. Example of field area for cleaning equipment, Mecojote irrigation project



8. Recycled refrigerator as pesticide storage (this practice is common on all the sites) at El Balsamo Irrigation System



9. Sedimentation tank after the intake at El Pinal, Lempira



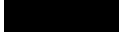




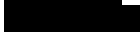
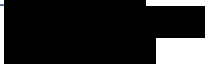











10. Use of local and recycle material like old drip irrigation pipes for shelters and trash sites (examples shown at Mecojote)



## ANNEX G. SITE VISITS COMPLETED

DATE	INSTITUTION	TITLE	NAME
September 25, 2015	Grupo Mixto PODER	Meeting with farmers	
September 28, 2015	MAPANCE	Gerente Unidad Técnica MAPANCE	
September 28, 2015	Instituto de Conservación Forestal in Gracias, Lempira	Coordinador de Áreas Protegidas y Vida Silvestre	
September 28, 2015	ProParque	Christopher Seeley	Director USAID/ ProParque
September 29, 2015	HQC	Técnica de HQC Técnica de HQC	
September 29, 2015	PROPARQUE farmer, Cruz Alta, Municipio La Campa, Lempira	Farmer	
September 29, 2015	PROPARQUE farmer, Llanito Verde, Campuca, Lempira	Farmer	
September 30, 2015	MERCADO farmer, El Balsamo, Copán	Meeting with farmers	
September 30, 2015	Grupo Fuerzas Unidas #3	Meeting with farmers	
October 1, 2015	ACS farmer Rodeo El Pinar, Lempira	Farmer	
October 1, 2015	ACS farmer, Proyecto de Riego Mejocote y Lagunilla, Lempira	Meeting with farmers	
October 26, 2015	Secretaría de Agricultura y Ganadería (SAG)	Subdirector	
October 27, 2015	Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre (ICF) Departamento de Vida Silvestre DVS)	Técnico en Biología  Técnico Forestal Técnico Forestal	
October 27, 2015	Instituto de Conservación Forestal (ICF) Departamento de Áreas Protegidas del ICF	Técnico en Biología  Técnico Forestal	
October 27, 2015	Instituto de Conservación Forestal (ICF) Programa Nacional de Reforestación (PNR)	Técnico Forestal	
October 27, 2015	Instituto de Conservación Forestal (ICF) Departamento de	Coordinadora del Departamento de Cuencas	

DATE	INSTITUTION	TITLE	NAME
	Cuencas/ICF		
October 27, 2015	Secretaria de Agricultura y Ganadería (SAG) Dirección de Ciencia y Tecnología Agropecuaria de la SAG	Director Subdirector	 
October 28, 2015	IHT Unidad Competitividad y Calidad Unidad de Sustentabilidad Ambiental de Turismo	Coordinadora de competitividad Jefe de Sostenibilidad Ambiental de Turismo	 
October 28, 2015	Secretaria de Agricultura y Ganadería (SAG) SENASA	Director General	
October 29, 2015	FHIS PODER	Project Coordinator Directorate of Major Infrastructure	
November 2, 2015 San Antonio de Norte, La Paz	FHIS PODER Sistema de Riego FHIS PODER	Supervisor Presidente Capacitador	 
November 3, 2015 Santa Lucia, La Paz	ACS	Sub Director Gerente de Zona	 Plus meeting with 10 male farmers
November 5, 2015 Ocotepeque  1. San Rafael  2. La Comunidad	Acceso a Mercado  Instituto de Conservación Forestal (ICF)	Gerente de Zona Especialista Manejo de Recursos Naturales Gerente Departamental Gerente Produccion Especialista post cosecha Técnico Meeting with farmers	  10 men and 1 woman 13 men and 2 women
November 5, 2015	MERCADO farmer, El Pinabete, Concepción Sur Santa Barbara	Farmers	
November 5, 2015	Habitantes de la comunidad El Pinabete	Farmers	
November 6, 2015	PROPARQUE Partner/Cooperativa Agrícola Cafetalera San Antonio Limitada meeting	Technicians	 
November 6, 2015	PROPARQUE farmer Comunidad La Majada, Zacapa, Santa Barbara	Farmers	
November 6, 2015	PROPARQUE farmer Comunidad La Majada, Zacapa, Santa Barbara	Farmers	
November 6, 2015	PROPARQUE farmer Comunidad La Majada, Zacapa, Santa Barbara	Farmers	
November 6, 2015	PROPARQUE farmer Comunidad La Majada,	Farmers	

DATE	INSTITUTION	TITLE	NAME
	Zacapa, Santa Bárbara		
November 6, 2015	PROPARQUE farmer Comunidad La Majada, Zacapa, Santa Bárbara	Farmers	

## ANNEX H. TREE SPECIES USED IN AGROFORESTRY

From Honduras Quality Coffee (nombres locales):

1. Plátano
2. Mango
3. Naranja
4. Lima
5. Limón
6. Durazno
7. Paterna
8. Banano
9. Guayaba
10. Aguacate
11. Supte
12. Madreado
13. Guama
14. Gravilea
15. Lesquin
16. Pino
17. Cedro Rojo / Blanco
18. Caoba
19. Guanijiquil
20. Pepeto
21. Izote
22. Gandul
23. Ocote
24. Cipres
25. Liquidambar
26. Con

El productor debería de contar con al menos 12 especies. Lo ideal es que las alturas vayan entre árboles de 3 metros hasta árboles de 7 u 8 metros, incluso más.

## ANNEX I. PREGUNTAS PREVIAS A ORGANIZACIONES DEL ESTADO

### ICF

- Conoce los Proyectos que USAID promueve en el Occidente de Honduras?
- Cree que esos Proyectos generan algún impacto ambiental negativo?
- Qué estrategia tiene el ICF para detener el avance de la tala en áreas prioritarias, para el cultivo de café? Sabe cuanta área se descombra anualmente para estos fines?
- Como hacer más expedito el proceso de declaratoria de bosques productores de agua?
- Las Juntas Administradoras de Agua Potable, podrán ser Comanejadoras de su área de influencia? Si esto es posible, que deben de hacer? Les afectará la nueva reglamentación de Finanzas que todo ente que maneje fondos debe de tener personalidad jurídica y pagar al estado?
- Como se asegura que un propietarios de cultivo de café al poner plantas maderables, serán de su uso exclusivo?
- Existe una clasificación de árboles maderables para asociar con el cultivo de café, según la altura?
- Existe un PM simplificado para plantaciones menores a cien ha?
- Que recomendaría para que los Proyectos apoyados por USAID-Honduras fueran más exitosos?

### DiBio

- Conoce sobre los Proyectos que USAID-Honduras promueve en el Occidente?
- Cree que estos Proyectos generan algún impacto negativo al ambiente?
- Están implementando PSA en el Occidente de Honduras? Cual es la mejor experiencia?
- Cuál es el procedimiento para implementar PSA? Que ley los regula?
- Como puede contribuir DiBio, para que los Proyectos de USAID en el Occidente puedan implementar PSA?

### SERNA/DECA

- Conoce sobre los Proyectos que USAID-Honduras promueve en el Occidente?
- Cree que estos Proyectos generan algún impacto negativo al ambiente?
- Como hacer más expedito el proceso de licenciamiento ambiental? Ahora mismo varios Proyectos de USAID no arrancan por no tener esta licencia.
- Si USAID exige a sus Proyectos hacer una EIA si considera que puede generar algún impacto negativo al ambiente; es posible aceptar la EIA de USAID o siempre será necesario una EIA de la DECA?

### DICTA

- Conoce sobre los Proyectos que USAID-Honduras promueve en el Occidente?
- Cree que estos Proyectos generan algún impacto negativo al ambiente?
- Existe coordinación entre los Proyectos de DICTA y los de USAID?
- Cree usted que es posible asociar estos Proyectos con el Programa de Vida Mejor del Gobierno? Si es posible, como sería?
- Que recomendaría para que los proyectos de USAID en el Occidente tuvieran mayor impacto?

### FHIS

- Conoce sobre los Proyectos que USAID-Honduras promueve en el Occidente?
- Cree que estos Proyectos generan algún impacto negativo al ambiente?
- Cómo funciona el Proyecto de USAID dentro del FHIS?
- Hay coordinación entre los Proyectos que apoya USAID dentro del FHIS con otros Proyectos del FHIS?
- Que recomienda para que los Proyectos apoyados por USAID tengan mayor impacto?
- Que problemas han tenido con la implementación del Proyecto (PODER)?
- Qué pasará con este Proyecto, cuando USAID ya no lo subvencione?

## ANNEX J. INTERVIEW GUIDE FOR FIELD WORK 2

### PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (PEA)

#### USAID/Honduras

##### Entrevista para Beneficiarias/os y Actores Clave

La presente entrevista ha sido diseñada con el objetivo de recopilar información de primera mano acerca del desempeño ambiental de los proyectos PROPARQUE, ACS, MERCADO, PODER e INVEST financiados por USAID/Honduras. El objetivo de la información obtenida será reconocer las principales problemáticas en las zonas de intervención de dichos proyectos, además de los impactos positivos y negativos de las actividades de los proyectos para incorporarlos dentro del Programmatic Environmental Assessment (PEA) USAID/Honduras.

El equipo evaluador está conformado por profesionales contratadas/os por Sun Mountain International y Cadmus con vasta experiencia en los diversos ámbitos ambientales de estudio. Como consultor independiente, el equipo evaluador mantiene una posición neutral respecto de los proyectos y considerará los criterios de las/os entrevistadas/os en el contexto de la evaluación ambiental.

Nombre del/a Entrevistado/a	
Institución/Organización	
Contacto	
Fecha	
Locación Geográfica y Política	
Nombre del/a Entrevistador/a	

#### ACTOR

- |  |   |
|--|---|
| <input type="checkbox"/> Finquero/a            | <input type="checkbox"/> Asociación/Organización,<br>Especifique: _____ |
| <input type="checkbox"/> Líder/esa Comunitario | <input type="checkbox"/> ONG,<br>Especifique: _____                     |
| <input type="checkbox"/> Político/a            | <input type="checkbox"/> Otro,<br>Especifique: _____                    |

#### CONDICIONES EXISTENTES

¿Cuáles son las ocupaciones principales de la población de la zona? (Agricultura, pesca, comercio, etc.)
¿De dónde provienen los principales ingresos familiares?

**PRINCIPALES PROBLEMÁTICAS DE LA ZONA (Relacionadas Directamente con el Proyecto)**

<i>MANTENIMIENTO DE VIAS EXISTENTES</i>
<i>BUENAS PRACTICAS AGRICOLAS SOSTENIBLES</i>
<i>SISTEMAS DE AGUAS DE RIEGO Y AGUA POTABLE</i>
<i>CONSERVACIÓN</i>

**PROYECTOS**

¿Qué proyecto(s) interviene(n) en la zona?
¿A cuántas personas benefician las actividades del proyecto y de qué manera?
¿Es usted beneficiaria/o del proyecto? ¿Cuál proyecto?
¿Cuáles son las actividades del proyecto en su propiedad/comunidad/área de intervención?
Fecha aproximada de inicio de actividades.
¿Considera usted que el/los proyectos y sus actividades son beneficiosas para la comunidad?
¿A qué otras personas/actores deberíamos tomar en cuenta en este proceso de evaluación ambiental?

**IMPACTOS ACUMULATIVOS**

<i>Cuencas de Agua (calidad y cantidad)</i>
<i>Condiciones eco-sistémicas (balances y amenazas)</i>
<i>Efectos a la salud</i>

<i>Impactos sociales a organizaciones comunitarias</i>
<i>Implicaciones económicas y de empleo a mujeres, grupos indígenas y otros grupos</i>
<i>Seguridad alimentaria</i>
<i>Emisiones de gases invernaderos</i>
<i>Flora y Fauna, incluidas aves migratorias</i>
<i>Beneficios económicos de la implementación de los paquetes GAP en fincas de pequeña y gran escala comparados con sistemas tradicionales agrícolas</i>

#### OTROS IMPACTOS

<b>IMPACTOS POTENCIALES:</b> ¿Considera usted que las actividades del proyecto causan algún <b>IMPACTO</b> a la comunidad y/o al ambiente? Explique.	
<b>NEGATIVOS</b>	<b>POSITIVOS</b>
<b>IMPACTOS ACUMULATIVOS:</b> ¿Considera usted que otros proyectos/actividades de otras instituciones/organizaciones/empresas en la zona causan <b>IMPACTOS</b> a la comunidad y/o al ambiente? Explique.	
<b>NEGATIVOS</b>	<b>POSITIVOS</b>

#### OBSERVACIONES

Consideraciones, recomendaciones, comentarios.
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## ANNEX K. LIST OF PREPARERS

### CORE (IN-COUNTRY) TEAM

**Mr. Charles Hernick** (Team Leader/Ecologist/Economist). Mr. Hernick (The Cadmus Group, Inc.) is an Environmental and Social Impact Assessment expert and expert on USAID environmental compliance requirements, including FAA Sections 118 and 119, most recently demonstrated through his contributions to assessments in Senegal, Mali, Peru and South Sudan and his management of a tropical forestry/biodiversity and climate change vulnerability assessment for 10 Caribbean countries. He has leveraged his background in ecology and economics to conduct environmental impact assessments for development projects in Asia and Africa, and to support environmental compliance trainings in Latin America and Africa. He established the procedures for USAID's quick-turn around and in-depth oversight of Multilateral Development Bank projects and has supported several USAID Affirmative Investigations. He has managed extensive policy and finance research and analysis, and facilitated expert consultations in the design of U.S. policy for mitigating the financial risks associated with environmental liabilities (i.e., polluter pays principle/financial assurance). Mr. Hernick has a B.S. in Ecology from the University of Minnesota and a M.A. in International Relations and Environmental Policy from Boston University.

**Mrs. Michelle Rodríguez** (Agricultural Specialist). Mrs. Michelle Rodríguez is Sun Mountain's Senior Agriculture, Agroforestry and Climate Change specialist. Mrs. Rodríguez is forestry engineer who holds a master's degree in Tropical Agroforestry from the Agronomic Research and Teaching Center (CATIE) in Costa Rica. She has more than 15 years of experience in the implementation of climate change adaptation and mitigation projects, as well as an intimate familiarity in ecosystem services and water harvesting projects in Central America and Ecuador. She has worked for IUCN, ACICAFOC, CATIE, and many other reputable organizations. Mrs. Rodríguez has extensive experience in Honduras, Guatemala, Costa Rica and Nicaragua. She also has vast experience in environmental assessment, technology transfer, forest management, and in strengthening capacities in climate change adaptation for local authorities and other key stakeholders. In addition, through her work experience, Michelle has developed influential contacts and the ability to coordinate with local governments and public institutions to generate strategic alliances that increase projects' impact in the territory. With Sun Mountain, Mrs. Rodríguez has been a key team member of the Guatemala Scoping Statement and Environmental Assessment and Honduras Scoping Statement.

**Mr. Carlos Ponce** (Social Specialist). Mr. Ponce holds several fourth degree diplomas in Honduras 1) Social Management, 2) Management of Development Projects, 3) Design and Management of Development Projects and Applied Research, and 4) Education on Human Rights and Democracy. He has been head of various offices in organizations such as World Vision and CARE in Honduras and has managed several development projects with NGOs and public institutions in Honduras. He has over 20 years of experience in organizational and capacity building on: community forestry development and management; profitable farming under forestry systems; community leadership and network strengthening; environmental audits for social development projects; food security in drought vulnerable communities; limit, protection and declaratory of water production areas to community water administration organizations; and community risk prevention, management and response for contingencies. He has worked with Tolupanes and Lenca indigenous groups in Yoro, Lempira and Intibuca. Mr. Ponce also has eight years of experience working with forestry, watershed and risk management in Honduras.

**Mr. Carlos Cobos** (Hydrologists). Mr. Cobos had worked in Water Resources for more than 25 years in Central America as hydrologist he had done water budgets for several projects funded by USAID, IDB, UICN, and WWF. Also he had been consultant in Climate Change for UNDP at the Guatemalan Climate Change program at the Ministry of Environment and Natural Resources. He had worked at Ministry of Agriculture of Guatemala on Integrated Water Management for an IDB project. His experience in agricultural projects and monitoring came when he worked for RUTA, a World Bank project based in Costa Rica, with a mission to give Technical Assistance to the Agricultural Sector in Central America, on areas as economics, irrigation, project preparation and monitoring and evaluation. He was key team member of the

Environmental Assessments – Rural Value Chain Program in Guatemala and Feed the Future in Haiti. He graduated as Civil Engineer in Guatemala from Universidad de San Carlos, and later he got a Master's degree on Water Resources at Oregon State University. He had been coordinator or project director in more than 25 projects, related to Water Resources, hydrology and hydraulics. For three years, he worked preparing Environmental Impact Assessments at Asesoría Manuel Basterrechea in Guatemala.

**Ms. Becky Myton** (Environmental Impact Assessment Specialist). Dr. Myton is a PhD Ecologist and Development Specialist with over 34 years of experience in diverse settings, including Central and South America, Asia, and Africa. She is a highly experienced, committed, and participatory team leader and team builder. She has extensive experience in natural resources management, agriculture, disaster risk management, water and sanitation, and irrigation programs. During 10 years with CARE she supervised projects in Honduras, Tajikistan, Bolivia, and Mozambique. She has 13 years of experience with US Regulation 216, including carrying out IEEs EAs, and training in Honduras, Guatemala, Tajikistan, Ethiopia, Uganda, and Mozambique. She has experience in strategic planning, incorporating central themes of gender, climate change, and participatory and rights based approaches. She has emergency response experience in Pakistan, Honduras, and Bolivia, including development and management of emergency response proposals, environmental assessment during emergencies, and biodiversity and tropical forest assessments. She is a SPHERE trainer. She helped develop the Rapid Environmental Assessment (REA) guidelines and did subsequent training. She has been an environmental consultant with USAID, World Bank, UNDP, IDB, government of Honduras, and CARE. She served for 5 years as Technical Advisor to the Minister of Environment, Honduras, and has 36 years' experience as a university professor in Honduras. She holds a Master of Science degree in Ecology, a Master of Science degree in Total Quality, and a PhD in Environmental Science.

## ADVISORY AND HOME SUPPORT TEAM

**Ms. Bridgett McCoy** (Research & Analysis and Home Office Support). Ms. McCoy (The Cadmus Group, Inc.) is an environmental policy specialist with development and climate change expertise. She has varied regional experience, conducting a study on service delivery for BRAC Bank in Dhaka, Bangladesh and a semester of studying in Havana, Cuba. Bridgett wrote the energy-efficient building policy for Bowdoin College and wrote small scale energy contracts in Maine. She organized campaigns on divestment from fossil fuels, renewable energy, and safe chemical policy. Ms. McCoy has a BA (triple major) in Government, Environmental Studies, and Spanish Literature from Bowdoin College with an Honors Thesis on the politics and social impacts of South Africa's and Mexico's carbon taxes.

**Mr. Dan Mahr** (GIS Specialist). Mr. Mahr is a GIS specialist with 5 years of experience using geographic information systems in environmental science applications, including climate change assessments, land use change studies, demographic modeling, and hydrographic analyses. Mr. Mahr is responsible for developing and implementing technically demanding large-scale data processing and visualization workflows. He supplements ArcGIS with the Python programming language to automate complex GIS tasks in custom GIS tools. In previous work for USAID, he modified AERMOD—an EPA air modeling software suite—to function in Kosovo by drastically modifying input data. He also created a geoprocessing tool that visualized the outputs of over 500 air quality modeling runs in a consistent and understandable format. In a 118/119 Assessment for Vietnam, Mr. Mahr prepared a series of maps describing the ecology, physiography, climate, and demographics of Vietnam. By client request, the source GIS datasets used were all publicly available to enable reproducibility and many were global-scale to enable inter-comparison. As part of an ongoing project for the US Army Corps of Engineers, Mr. Mahr has worked extensively in calculating, aggregating, and visualizing indicators of climate change vulnerability on a watershed scale. In this role, he used GCM outputs to calculate a variety of hydrological indicators of vulnerability on watershed scale and developed geoprocessing tools that allow for rapid mapping and visualization of climate change vulnerability. Mr. Mahr has a B.S. in Environmental Science from Brown University, where he conducted honors research on remote sensing of agricultural intensification later published in *Philosophical Transactions of the Royal Society B: Biological Sciences*.

**Ms. Tara Fortier** (Quality Assurance/Quality Control). Ms. Fortier (The Cadmus Group, Inc.) is an environmental specialist with a background in international development and seven years of experience supporting federal environmental policy development and implementation. Ms. Fortier has contributed to recent FAA Sections 118 and 199 assessments for South Sudan and Barbados and the Eastern Caribbean, and Environmental Threats and Opportunities Assessments (ETOAs) in Mali and Senegal. She has utilized her experience in environmental impact assessment and social issues in the development of Affirmative Investigations for large hydropower projects including Inga 3-BC (DRC), Luhri (India), and a series of run-of-the-river dams in Nepal. Ms. Fortier has a B.A. in Environmental Studies (emphasis on International Development) from Allegheny College, where she conducted a senior thesis on developing an international carbon offset program and engaging stakeholders in the program through a religious focusing point.

## ANNEX L. BRIEFING NOTES

### OBJECTIVE

The PEA covered DO2 activities with foreseeable environmental impacts in the six western departments of Honduras (Santa Barbara, La Paz, Intibucá, Copán, Ocotepeque, and Lempira) with the goal of assessing the **environmental effects of the Proposed Action and comparing likely effects to those of two alternative approaches to development**. The two alternatives compared were: No Action (i.e., USAID does not engage in the region) and an Alternative developed by the Assessment Team—in consultation with Implementing Partners and USAID—that would avoid or minimize adverse effects or enhance the quality of the environment while meeting the same purpose and need.

### RECOMMENDATIONS

The Assessment Team recommends the **Alternative, including all elements in the Proposed Action (defined as ongoing projects)—including existing mitigation measures in approved EMMPs—plus additional mitigation measures**.

The Alternative approach to development and the Proposed Action are not mutually exclusive. Indeed, they are complimentary, and USAID could fund the Alternative through a separate contract to build off of the Proposed Action. Above all the Alternative integrates the different initiatives and assures long term sustainability so the producers are more resilient to market and climate changes, that infrastructure has longer life, and that the natural resources and ecosystem services in the western area of Honduras are safeguarded.

### METHODOLOGY

The Assessment Team consisted of a five full-time consultants with expertise in: Environmental Impact Assessment, ecology, hydrology/integrated water resources management, agroforestry, and sociology. The PEA consisted of steps including preparatory research, scoping, stakeholder meetings, site visits and consistency review of other USAID EAs in progress, namely the Cosecha project in Southern Honduras.

### NUMBERS OF ISSUES

Sixteen potential issues were identified during Scoping. Over the course of the analysis seven issues were eliminated because they were determined not to be significant. Examples of issues identified included: risk of source water protection failure; weak coordination among USAID projects with the government of Honduras; shift away from Best Agricultural Practices if markets are not robust; loss of forests and biodiversity from agricultural expansion; inappropriate use of pesticides; insufficient climate change adaptation measures; and increased social disparity between project beneficiaries and non-beneficiaries.

### EFFECTS

Effects were analyzed and documented for each of the components of the Alternative, the Proposed Action, and the No Action Alternative. The anticipated environmental effects of the Proposed Action are far better (i.e., environmentally beneficial) than the No Action Alternative. However, the long-term sustainability of the Proposed Action may be at risk for different reasons—specifically those related to watershed management, coordinated development within watersheds, and the sustainability of market access. Based on this effects analysis the team recommended the Alternative, as stated above.

## ANNEX M. GUIDELINES FOR ENVIRONMENTAL MITIGATION AND MONITORING PLANS (EMMP)



### GUIDELINES FOR IMPLEMENTING PARTNERS

#### USAID/LATIN AMERICAN AND CARIBBEAN BUREAU (LAC) ENVIRONMENTAL MITIGATION AND MONITORING PLAN (EMMP)<sup>28</sup>

November 19, 2015

#### A. Background

##### *Definitions*

*Activity - Overall USAID action being undertaken through a particular implementing mechanism*

*Intervention - Discrete actions undertaken to accomplish activity goals*

*Component - A sub action required to complete an intervention*

All activities funded by USAID must conform to its environmental procedures outlined in 22 CFR 216, which require Initial Environmental Evaluations (IEE) to ensure that “environmental factors and values are integrated into the USAID decision-making process” and that “the environmental consequences of USAID-financed activities are identified and considered by USAID and the host country prior to a final decision to proceed and that appropriated environmental safeguards are adopted”.

All USAID activities funded through USAID’s Latin America and the Caribbean (LAC) Missions are issued an Environmental Threshold Decision (ETD) by the Bureau Environmental Officer (BEO) pursuant to the IEE as per 22 CFR 216.3(a) 2. One category of Threshold Decision is the Negative Determination (22 CFR 216.3(a) 3, which is given to projects that are not “found to have a significant effect on the environment” when certain conditions are in place. In LAC, the development of an Environmental Mitigation and Monitoring Plan (EMMP) is often one of the conditions set forth in the Negative Determination with Conditions (NDWC) ETD. The EMMP ensures compliance with 22 CFR 216 by identifying and mitigating environmental effects of USAID activities and by meeting any other conditions specified in the applicable ETD. It is also used for any sub-award interventions where the specific actions of sub-award are not yet

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<sup>28</sup> This replaces all previous Environmental Mitigation Plan and Report (EMPR) forms

identified at the time of award. In addition, Table 3 of the EMMP form can be used as a Mitigation and Monitoring Plan for Environmental Assessments (EA).

Activities carried out by implementing partners (IPs) of USAID/LAC Missions include a range of discrete interventions under various awards that will likely have a risk for significant environment effects. Examples include interventions such as infrastructure refurbishment or medical waste management. This EMMP procedure will provide for both the screening for environmental risk, the preparation of a mitigation plan and reporting on monitoring of these mitigation measures. Gender and persons with disabilities are also considered as social impact factors in the development of a mitigation plan as these have a direct bearing on the type and kind of mitigation measure to be prescribed. Global Climate Change (GCC) and its impact on the project, as well as the project's to exacerbate GCC is also a consideration within the EMMP process. Finally, the EMMP is an effective tool for applying USAID's Sector Environmental Guidelines to an activity or program which has been developed as per 22 CFR 216.3(a)3(iii). (<http://www.usaidgems.org/sectorguidelines.htm>).

The EMMP initially categorizes interventions into three risk categories: No Risk, Medium Risk, and High Risk. Those with No Risk can continue without further review upon completion of the Table 1 screening form and review and approval of the risk analysis by the Agreement/Contract Officer's Representative (AOR/COR) and the Mission Environment Officer (MEO). The EMMP typically deals with those interventions at Medium Risk (*see Figure 2*). Those with High Risk must be reconsidered for the need of an EA. Risk is further defined in section C1 below.

Most awardees that receive a Negative Determination with Conditions ETD will be required to fill out an Environmental Mitigation and Monitoring Plan (as attached) per intervention type that includes:

1. Narrative (Justification/Background, Baseline Information/Existing Conditions, Description of Activities, and Social Considerations sections must be completed at a minimum).
2. The Environmental Screening Form (Table 1),
3. The Environmental Mitigation Plan (Table 2), and
4. The Environmental Monitoring Table (Table 3).

AOR/CORs, Activity Managers, and Implementing Partners can work with the USAID MEO to ensure that environmental effects are sufficiently identified and mitigation actions are agreed upon, including clear guidance on the procedures for GCC and social considerations, where and appropriate.

## **B. Timing of EMMP**

All solicitations for activities that fall within the NWDC will include this document as part of the solicitation package as per the ADS 204 annex regarding solicitation language. As per direction outlined here and in the Environmental Considerations section of all solicitation, potential applicants must present a draft EMMP with their submission. This is important, as the funding for mitigation implementation identified in Table 3 must be incorporated in the applicant's

proposal budget. The draft EMMP can also serve as a criterion for selection by the Technical Evaluation Committee reviewing proposals.

Once the Implementing Partner (IP) is chosen, the applicant submits a revised initial EMMP or contractor to the AOR/COR at the time the initial work plan is submitted. **The MEO, and the Regional Environmental Advisor (REA) must approve this EMMP before work can commence.** For sub-awards, the awardee is required to fill out the EMMP and submit it for approval to the Chief of Party (COP). The COP then submits the EMMP for review and final approval to the AOR/COR and MEO. **Implementation of interventions shall not occur until final approvals of the EMMPs are received.**

A format for this initial EMMP can be seen in attachment 1; it includes:

1. An initial screening process using the “Environmental Screening Form” (Appendix 1, Table 1) to assure the intervention is at the Medium Risk Level.
2. The identification of potential impacts and related mitigation measures using the “Environmental Mitigation Plan” (Appendix 1, Table 2) for each component of the intervention.
3. The Environmental Monitoring Table (Appendix 1, Table 3) includes the necessary mitigation measures to be monitored, the monitoring indicators, who will conduct the monitoring, and when will the monitoring occur. Table 3 also includes a monitoring chart that documents who conducted the monitoring and the effectiveness of the mitigation measures.

At the end of each year of implementation, the EMMP is resubmitted with the same information as provided initially, along with a report reflecting the status of implementation and effectiveness monitoring of the identified mitigation measures using the “Environmental Monitoring Table” (Appendix 1, Table 3). This serves as the Annual Environmental Compliance Report (ECR) required by most implementing mechanisms. The ECR can be part of the annual Report required for the overall Activity as per the award requirements.

Results from the ECR are subsequently incorporated into a revised EMMP that shall be submitted to the AOR/COR for approval by the MEO/REA that reflects any new interventions in the activity's second year work plan along with any changes to mitigation measures based on the prior year's monitoring. This process of submitting the EMMP monitoring report at the end of the year, together with a revised EMMP that reflects the following year's work plan, is repeated each year until the close of the activity (See Figure 1).

### **C. Initial Environmental Mitigation and Monitoring Plan**

#### **1. Classification of Level of Risk**

Different interventions under an award can have varying levels of risk for environmental effects and therefore require different courses of action (Figure 2). No-risk interventions, classified under “a” below, do not require the development of an Environmental Mitigation Plan (Table 2) or an Environmental Monitoring Table (Table 3) and could be covered under a Categorical Exclusion (22 CFR 216.2(c)). The AOR/COR should consult with the MEO to determine if the action in question has already received Categorical Exclusion or if one must

be requested from the BEO. Interventions identified as Medium-risk (“b”) require the IP to screen those potential environmental effects and develop a plan to mitigate them. High-risk interventions (“c”) include interventions that have irrevocable change and/or cannot be mitigated by the implementation of industry standards, best management practices, or design specific implementation standards and, therefore, are considered to have significant environmental effects that will require an EA (22 CFR216.2 (d)).

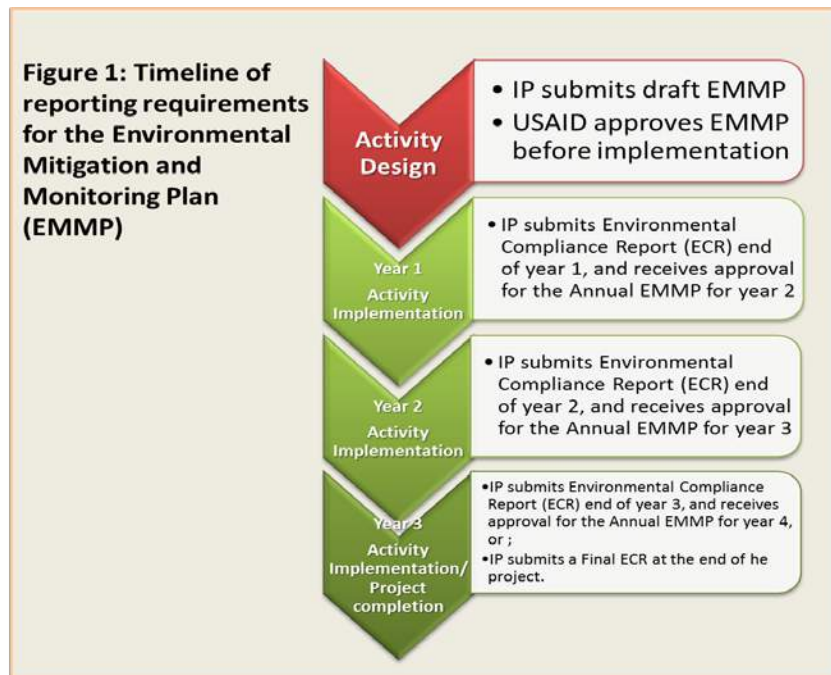
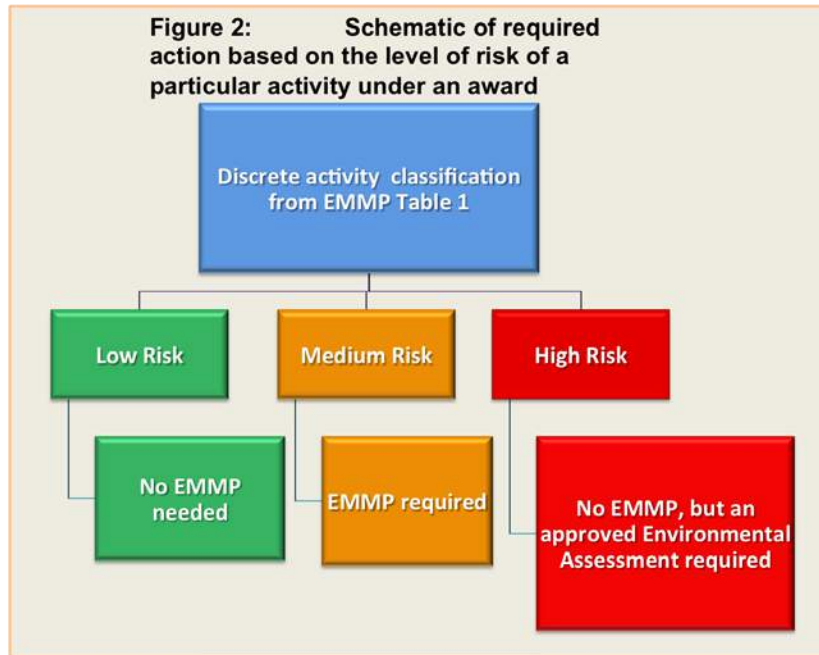


Figure 2 below depicts schematic of required action based on the level of risk of a particular intervention under an award. Note: all sub-award interventions are required to have an EMMP completed. If all questions on Table 1 are checked No, then the sub-award intervention falls under the low risk category and implementation could start directly without further analysis, pending approval of the work plan by the AOR/COR and MEO.



a) Discrete interventions that do not require mitigation plans (No-Risk):

An illustrative list of no-risk discrete intervention where no mitigation reporting is required includes:

- Education or training, unless it implements or leads to implementation of actions that impacts the environment (such as construction of schools or use of pesticides)
- Community awareness initiatives
- Controlled research/demonstration activities in a small area
- Technical studies or assistance (unless actions include agriculture and pesticides)
- Information transfers

If there is a risk that the actual implementation of subjects learned during training could adversely affects the environment (e.g., training on agricultural techniques), the training is expected to include as part of its curriculum, an analysis of environmental effects a plan for mitigation. Mitigation measures such as Good Agricultural Practices/Best Management Practices would need to be identified for use in training as a mitigation measure and listed in Table 2 of the EMMP.

Many discrete interventions under an agreement will fall between the two extremes of low and high risk and may cause some significant environmental effects that can be avoided or mitigated with proper planning. For these interventions, the IP will be responsible for completing the EMMP on an annual basis.

b) Discrete interventions that cannot be supported (High-Risk):

Under USAID's Environmental Procedures, if there is a proposed action that may have significant environmental effects, an approved EA is required prior to its implementation

(22 CFR 216.2(d)1). In the case of pesticide use, a Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) will be prepared by the partner and approved by the LAC BEO (22 CFR 216.3 (b)). Such interventions include, but are not limited to:

- Agricultural, livestock introduction or other activities that involve forest conversion
- Resettlement of human populations
- Construction of water management systems such as dams or impoundments
- Drainage of wetlands
- Introduction of exotic plants or animals in protected areas
- Permanent modification of the habitat supporting an endangered species
- Industrial level plant production or processing (this does not include community or regional plant nurseries aimed at restoring areas after fires, for example)
- Installation of aquaculture systems in sensitive water bodies including rivers, lakes, and marine waters (not land-based fish ponds)
- Procurement of timber harvesting equipment, including chainsaws
- Use of restricted use pesticides (insecticides, herbicides, fungicides, etc.)
- Large-scale reconstruction in un-degraded lands, such as within protected areas
- Large-scale new construction (over 1,000 meters<sup>2</sup>)
- Timber harvesting, or cutting of trees over 20 cm diameter breast height related to forest management or for commercial products.
- Construction of penetration roads and/or reroutes

#### c) Cumulative Effects

Even though individual interventions may be considered medium risk, when those interventions are analyzed in terms of other USAID actions and/or other non-USAID actions that are likely to occur, cumulative effects must be considered and may require the development of an EA.

#### d) Extraordinary circumstances

Certain extraordinary circumstances must be considered and may require an EA. These include

- impacts to sensitive terrestrial or aquatic areas (see question 14)
- impacts to unique cultural or historical features (see question 28)

## 2. Environmental Screening Form

The Environmental Screening Form (Appendix 1, Table 1) contains information relevant to the potential environmental effects over the life of the intervention with regard to natural resources, the environment, and human health. If items in Column “A” of the Environmental Screening Form are checked “YES”, then items for monitoring and mitigation are to be specified in the “Environmental Mitigation Plan” (Appendix 1, Table 2). The Environmental Mitigation Plan simply outlines the plan of action for mitigation of potential environmental effects. If all Column A is checked “NO”, then Tables 2 and 3 are not required to be completed and the intervention can begin **upon approval from the COR/AOR and MEO**. When all of Table 1 questions are checked “NO”, the MEO must ensure that the intervention

listed in the “Description of Activities” narrative section truly will not cause impacts to the environment. The MEO must also ensure that all of the actions for the intervention are listed in the Narrative and that each action is covered in Table 1.

For reference on mitigation information on a wide variety of discrete interventions, refer to the USAID/GEMS Sector Environmental Guidelines. <http://www.usaidgems.org/sectorGuidelines.htm>. Illustrative sector-specific guidelines also include: WHO guidelines for handling and disposal of medical waste, “[Low-Volume Roads Engineering: Best Management Practices Field Guide \(Keller and Sherar, 2003\)](#)” and the World Wildlife Fund Agriculture and the Environment, A WWF Handbook on Agricultural Impacts and Better Practices (Clay, 2004).

#### **D. Annual Environmental Compliance Report**

As per terms and conditions of all awards with USAID, each implementing partner is expected to submit an Annual Report, which normally requires an ECR. If an EMMP has been developed, it should be used to fulfill this requirement. The ECR should contain information relevant to the potential environmental effects over the life of a discrete intervention under an award and includes: a) a copy of the initial EMMP completed during the initial intervention planning (reference Section B above); b) the prescribed mitigation measures using the “Environmental Mitigation Plan (Appendix 1, Table 2)” and c) synthesized data on these mitigation measures collected throughout the year and tracked in the “Environmental Monitoring Table (Appendix 1, Table 3)”. As it is often difficult to quantitatively measure progress of complex mitigation measures, it is necessary to include inserted digital photos (with relevant maps) to describe progress of mitigation measures.

#### **E. Sections of the EMMP**

1. EMMP Coversheet
2. EMMP Narrative (to be filled out with intervention specific information). NOTE: details for each of the actions to be implemented must be listed in the “Description of Activities” section of the Narrative.
3. Appendices:
  1. Environmental Screening Form (Table 1)
  2. Environmental Mitigation Plan (Table 2)
  3. Environmental Monitoring Table (Table 3)
  4. Photos, Maps, Level of Effort

Reference: February 8, 2007; L. Poitevien (USAID/Haiti), M. Donald (USAID/Dominican Republic), E. Clesceri (USAID/Washington). Guidelines for Implementing Partners on the USAID Haiti Environmental Mitigation Report.

## USAID/LAC ENVIRONMENTAL MITIGATION AND MONITORING PLAN (EMMP)

### A. Coversheet for ENVIRONMENTAL MITIGATION and MONITOR PLAN (EMMP)

USAID MISSION DO # and Title: \_\_\_\_\_

Title of IP Activity: \_\_\_\_\_

IP Name: \_\_\_\_\_

Award Number: \_\_\_\_\_

Funding Period: FY\_\_\_\_\_ - FY\_\_\_\_\_

Associated IEE/ETD: \_\_\_\_\_

Life of Activity Funding (US\$): \_\_\_\_\_

Title of Discrete Intervention \_\_\_\_\_

Report Prepared by: Name:\_\_\_\_\_ Date: \_\_\_\_\_

Date of Previous EMMP: \_\_\_\_\_ (if any)

Status of Fulfilling Mitigation Measures and Monitoring:

Yes    No  
\_\_\_\_    \_\_\_\_    Initial EMMP.

\_\_\_\_    \_\_\_\_    Annual EMMP.

USAID Mission Clearance of EMMP for XXX Intervention:

Contract/Agreement Officer's Representative: \_\_\_\_\_ Date: \_\_\_\_\_

Mission Environmental Officer: \_\_\_\_\_ Date: \_\_\_\_\_

Regional Environmental Advisor: \_\_\_\_\_ Date: \_\_\_\_\_

### B. Environmental Mitigation and Monitoring Plan Narrative

#### 1. Background, Rationale and Outputs/Results Expected:

Provide a brief summary of the intervention(s) under consideration and expected results.

#### 2. Environmental Baseline:

Describe the existing condition of the area of the intervention. This should include a description of/baseline information on the natural and physical resources that could potentially be affected by the intervention. Provide information on the existing infrastructure, roads, and agricultural systems, etc. if relevant to the intervention. Succinctly describe location, site details; surroundings (include a map, even a sketch map). Include information on any “unique or extra-ordinary” resources that are within the intervention area such as wetlands, critical habitat, etc. Include information on the existing climate trends and conditions such as how might environmental conditions change due to climate change for the life of the intervention and expected lifespan of the interventions? Describe how the intervention will involve men, women, and indigenous cultures whose actions during the life of the intervention may have a direct effect the environment, or how the actions of the intervention may have an impact on them. Methodologies for data collection and analysis for gender-sensitive implementation and monitoring of interventions are encouraged.

### 3. Activity Description/Specific Actions to be implemented:

Provide both quantitative and qualitative information about actions to be undertaken during the intervention (e.g. specific actions of construction-size, location, and type of materials to be used, etc.), types of agriculture production (full till mechanized, organic etc.), how the intervention will operate, and any connected interventions that are required to implement the primary interventions (e.g., road to a facility, need to quarry or excavate borrow material, need to lay utility pipes to connect with energy, water source or disposal point or any other intervention needed to accomplish the primary one but in a different location). If various alternatives have been considered and rejected because the proposed intervention is considered more environmentally sound, explain these.

#### Example:

New construction of a 900 square meter youth center located in XXX town and is 70 meters from the River XXX. Construction will be of block and cement with rebar reinforcing. Construction will include a new two-stall toilet and sinks using town water source from pipes. A 20 square meter biodigester will be used to capture waste and methane gas piped to the youth center kitchen for use as cook fuel. Biodigester will be underground and built of concrete by molds. Electrical wiring for the youth center will be installed with the power source by solar panels on the zinc roof and batteries/electrical circuits located attached to the center in a closed and locked storage room.

Interventions with sub-awards require a specific EMMP for each award.

### 4. Evaluation of the Potential for Environmental Effects (Tables 1 and 2):

As a component of conducting environmental screening and developing the Environmental Mitigation Plan (Appendix 1, Table 2), briefly summarize environmental effects that could occur before, during, and after implementation, as well as any problems that might arise with restoring or reusing the site, if the facility or intervention were completed or ceased to exist. Explain direct, indirect, and cumulative effects on various components of the environment (e.g., air, water, geology, soils, vegetation, wildlife, aquatic resources, historic, archaeological or other cultural resources, people and their communities, land use, traffic, waste disposal, water supply, energy, climate change adaptation, climate change mitigation,

etc.). Indicate positive impacts and how the natural resources base will be sustainably improved.

For example, any intervention that increases human presence in an area, even temporarily, will increase noise, waste, and the potential for hunting, timber harvesting, etc.

#### 5. Environmental Mitigation Actions (Tables 2 & 3):

For the Initial EMMP, summarize the mitigation measures in the “Environmental Mitigation Plan” (Table 2) and briefly describe how these measures will be monitored in the “Environmental Monitoring Table” (Table 3). Ensure that Table 3 includes the cost of implementing and monitoring each of the mitigation measures listed.

For the Annual EMMP, describe the effectiveness of mitigation measures based on monitoring. For example:

- a) What mitigation measures have been put in place? How is the success of mitigation measures being determined (i.e., indicators)? Explain if and why the mitigation measures are not working or not effective? What adjustments need to be made?
- b) What is being monitored, how frequently and where, and what action is being taken (as needed) based on the results of the monitoring?

#### 6. Social Considerations

Gender equality is a USG-wide priority and USAID has, and will continue to take a lead role in that effort. Integrating gender considerations into all stages of planning, programming, and implementation of development assistance is not only a legal mandate; it is an essential part of effective and sustainable development. The Automated Directive System (ADS) 201 sets out specific requirements to help ensure that appropriate consideration is given to gender as a factor in development planning at the Development Objective and the Intermediate Results level of Development Objectives all the way down to the interventions level. This programming policy includes clear guidance on the procedures for gender integration where determined to be appropriate.

Additionally, the USAID Disability Policy Paper ([http://pdf.usaid.gov/pdf\\_docs/PDABQ631.pdf](http://pdf.usaid.gov/pdf_docs/PDABQ631.pdf)) sets out specific requirements to help ensure that appropriate consideration is given to persons with disabilities as a factor in development planning at the Development Objective and the Intermediate Results level of Development Objectives all the way down to the intervention level. Therefore, gender and persons with disabilities considerations are included in the EMMP checklist to ensure intervention implementation adheres to agency priorities and mandate. Additional information can be found at the following website: [http://www.usaid.gov/sites/default/files/Guide\\_How\\_Integrate\\_Disability\\_Gender\\_Assessments\\_2010.pdf](http://www.usaid.gov/sites/default/files/Guide_How_Integrate_Disability_Gender_Assessments_2010.pdf).

Impacts on indigenous cultures and their traditions should also be considered.

Ultimately, consideration of social issues helps avoid significant environmental effects (see 216.3 (a)(3)(iii)). Environmental mitigation measures should be specifically designed to take in account social issues such as gender and persons with disability, thus ensuring greater

success of the mitigation measure and greater long-term sustainability of the intervention. The impacts and roles of women and children should be also taken into consideration when completing Table 2 regarding environmental (social) impacts and designing mitigation measures.

## 7. Climate Change Integration

Climate change impacts all areas of development and is often considered both a threat and a driver to many activities that USAID supports. Good climate change integration is part of good activity design. In addition, Executive Order 13677: "Climate-Resilient International Development" encourages integration of the Agency's GCC Initiative (GCC) of mitigation and adaptation principles throughout its portfolios. Therefore, GCC impacts (to the intervention and from the intervention implementation) shall also be considered. Actions that would minimize GCC impacts shall be included in the list of mitigation measures to be implemented.

## Appendix 1. Environmental Screening Form (Table 1)

Name of intervention: _____ Implementing Partner: _____ Award Number: _____ Date: _____ Relevant IEE/ETD# _____		Column A	Column B	Column C	
		Yes	No	If answered yes to Column. A. Is it a high risk or medium risk	
				High Risk	Medium-Risk
<b>INFRASTRUCTURE (Buildings, roads, WASH, etc.)</b>					
1	Will the intervention involve construction and/or reconstruction/rehabilitation of any type of building? For new construction, if less than 1,000 m <sup>2</sup> = medium risk, if greater than 1,000 m <sup>2</sup> = high risk. <sup>1</sup>				
2	Will the intervention involve building penetrating roads, road rehabilitation and maintenance or other road related infrastructure (drainage, bridges, etc.)? If penetrating road construction/rerouting = high risk <sup>2</sup> , if repair/rehabilitation (improving drainage, resurfacing of existing roads) = medium risk.				
3	Will the intervention involve construction or rehabilitation of water and sanitation infrastructure (irrigation systems, potable water, water harvesting, septic systems etc.). Potable water systems require testing for bacteria, arsenic and other heavy metals.				
4	Will the intervention involve construction or rehabilitation of any other infrastructure such as landfills, incinerators, energy infrastructure, etc.				
5	Will the infrastructure intervention cost more than US \$500,000 <sup>3</sup> ? If YES, approval of a USAID Engineer is required as mitigation measures in Table 2. Additionally, compliance with FAA 611 is required (please consult with the mission legal advisor).				
6	Does the intervention require adherence to national building code or other national regulatory standard? Mitigation measures in Table 2.				
7	Does the intervention require local planning permissions (i.e. zoning, building permits, etc.)				

<b>BIOPHYSICAL</b>					
8	Will the activity include the purchase, use, plans to use, and/or training in the use of pesticides (including bio-pesticides such as neem)?				
9	Will the intervention involve changes in water quality (pollution, sedimentation, stagnation, salinization, temperature change, etc.)				
10	Will the intervention affect surface or groundwater quantity				
11	Will the intervention involve training and/or implementation of agricultural practices/production including animal husbandry?				
12	Will the intervention involve aquaculture systems?				
13	Will the intervention involve the use or disposal of hazardous materials (used engine oil, paint, varnish, lead-based products, fluorescent light bulbs/mercury, batteries, asbestos or other hazardous or special management waste)? Consider effects to both the biophysical environment and human health.				
14	Will the intervention involve implementation of timber				

	management <sup>5</sup> , extraction of forest products, clearing of forest cover, and/or conversion of forest land by cutting of trees >20cm diameter at base height (DBH)?				
15	Is the intervention in or near (within 50m <sup>6</sup> ) any sensitive terrestrial or aquatic areas including protected areas, wetlands, critical wildlife habitat (including nesting areas), and threatened or endangered species?				
16	Will the interventions proposed generate airborne particulates (dust), liquids, or solids (i.e. discharge pollutants) or potentially violate local air standards?				
17	Will the intervention create objectionable odors?				
18	Will the intervention occur on steep slopes (greater than 15%)?				
19	Will the intervention contribute to erosion?				
20	Will the intervention change existing land use in the vicinity?				
21	Is the proposed intervention incompatible with land type (i.e., annual crops on steep slopes, infrastructure on poorly drained soils)?				
22	Will the intervention affect unique geologic or physical features?				
23	Will the intervention have potential effects to inhabitants, natural landscapes, or flora/fauna downstream from the intervention site?				
24	Will the intervention have a direct or indirect effect, or include actions with mangroves, coral reefs and other marine/coastal ecosystems?				
<b>GLOBAL CLIMATE CHANGE</b>					
25	Are interventions or outcomes vulnerable to changes in the weather or climate such as changes in precipitation patterns, increased temperatures or sea level rise?				
26	Does the intervention exacerbate climate change vulnerabilities (i.e., drought, flooding, decrease water supply)?				
27	Will the intervention create greenhouse gas emissions from decomposing waste, burning of organic matter, or use of fossil fuels etc. (consider duration and scale)				
<b>SOCIO ECONOMIC</b>					
28	Will the intervention contribute to displacement of people, housing or businesses?				
29	Will the intervention affect indigenous peoples and/or unique cultural or historical features?				
30	Will the intervention expose people or property to flooding?				
<b>ENVIRONMENT &amp; HEALTH</b>					
31	Will the intervention create conditions encouraging an increase in illness, diseases, or disease vectors (waterborne, STDs or other)?				
32	Will the intervention generate hazards or barriers for pedestrians, motorists or persons with disabilities?				
33	Will the intervention involve the use, storage, handling or disposal of syringes, gauzes, gloves and other biohazard medical waste?				
34	Will the intervention expose workers to occupational hazards?				
35	Will the intervention increase existing noise levels?				
<b>GENDER<sup>7</sup></b>					
36	Does the intervention inhibit the equal involvement of men and women?				
37	Do the intervention results disproportionately benefit/impact men and women?				
<b>OTHER</b>					
38	Does the intervention/activity involve a sub-award component? <sup>8</sup>				
39	Is an operations and maintenance plan required? (for all type of				

infrastructure, equipment, road rehabilitation, or water and sanitation action = Yes)				
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RECOMMENDED ACTION (Check Appropriate Action):		(Check)
(a)	The intervention has no potential for significant effects on the environment. No further environmental review is required (Categorical Exclusion). No further action required.	
(b)	The intervention includes mitigation measures and design criteria that if, applied will avoid a significant effect on the environment (Negative Determination with Conditions). EMMP Required.	
(c)	The intervention has potentially substantial or significant adverse environmental effects; therefore, an EA is required before intervention implementation (Positive Determination). NOTE: if any question is marked as High Risk, an EA is required and Tables 2 and 3 of the EMMP do not need to be completed.	
(d)	The intervention has significant adverse environmental effects that cannot be mitigated. Proposed mitigation is insufficient to eliminate these effects and alternatives are not feasible. The intervention is not recommended for implementation. *For sub awards, do not fund.	

<sup>1</sup>Construction interventions need to be reviewed for scale, planned use, building code needs and maintenance. New construction having a footprint larger than 1000 meters<sup>2</sup> or 10,000 feet<sup>2</sup> is considered large scale and high risk. Some small construction interventions, such as building an entrance sign to a park, may require simple mitigation measures whereas larger buildings will require more extensive review and monitoring.

<sup>2</sup>New construction of roads are considered high risk and will require a full environmental assessment of the planned construction, i.e. a Positive Determination. Any reroutes of a road or trail longer than 100 meters is considered a high risk. Reroutes within a protected area, nearby a water source/wetlands, and/or archaeological site are considered a high risk.

<sup>3</sup>Pursuant to FAA, section 611, Completion of Plans and Cost Estimates.

<sup>4</sup>The purchases of packaged store pesticides are included. The planned procurement and/or use or training on the use of pesticides will trigger the need to develop an amended Initial Environmental Examination that meets USAID pesticide procedures (Pesticide Evaluation Report and Safer Use Action Plan or "PERSUAP") for the intervention.

<sup>5</sup>Any interventions that involve the commercial harvesting of trees or converting forests is considered high risk and will require a full environmental assessment of the intervention (i.e. Positive Determination). The reference to cutting trees of greater than 20cm dbh is for actions related to forest management and commercial forest products and not for individual trees being cut for construction or non-commercial purpose.

<sup>6</sup>Less than 50meters is based on best practices from US Federal and State regulations.

<sup>7</sup>A positive response to gender questions require follow up only when there are other positive responses on questions, and an EMMP is developed.

<sup>8</sup>If the intervention includes a sub-award component, each sub-awardee shall be required to prepare an EMMP prior to implementation of the sub-award.

## Appendix 2. Environmental Mitigation Plan (Table 2)

Enter the Question/Row # of the potential negative effects with check marks in Column A (Table 1) and complete table below for mitigation measures to reduce or eliminate the issue. In the Sub-Activity or Component Column, list the main actions to be implemented. Under each action, list the tasks (Steps) that are needed to implement this action.

	Name of intervention: _____ Implementing Partner: _____ Award Number: _____ Date: _____ Relevant IEE/ETD #: _____		
# of the question from Table 1	Action or component with the different tasks required to implement the action.	Description of Environmental Effect	Environmental Mitigation Measures*
1	Component - Construction and maintenance of latrine		
	Step 1- design		
	Step 2- location		
	Step 3- purchase of materials		
	Step 4- build latrine		
	Step 5- site cleanup/disposal of construction waste		
	Step 6- use of latrine/operations and maintenance		
9	Component – Purchase and construction of a water storage system		
	Step 1		
	Step 2		
	Step 3		
	etc.		

\* Please be as specific as possible. Sample mitigation measures are located in the USAID Sector Environmental Guidelines or other pertinent guidelines, see <http://www.usaidgems.org/sectorGuidelines.htm>. Details on exact monitoring plan are illustrated in Table 3, Environmental Monitoring and Evaluation Tracking Table.

### Appendix 3. Environmental Monitoring Table (Table 3)

Award Number:
intervention Name:
Implementing Partner:
Location Name:
Nearby Communities:
Senior Activity Manager:
Monitoring Period:
Date:

	Description of Mitigation Measure (same as in Table 2 or mitigation measures identified in PERSUAPs and EAs)	Responsible Party for implementing and monitoring mitigation measures	Monitoring Methods			Estimated Cost of implementing mitigation measures and monitoring	Results			Recommended Adjustments
			Indicators of implementation and effectiveness of indicators	Methods	Frequency		Dates Monitored	Problems Encountered	Mitigation Effectiveness	